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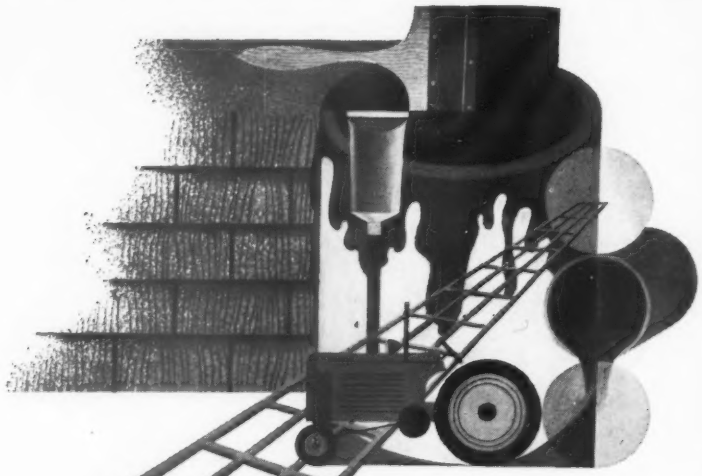

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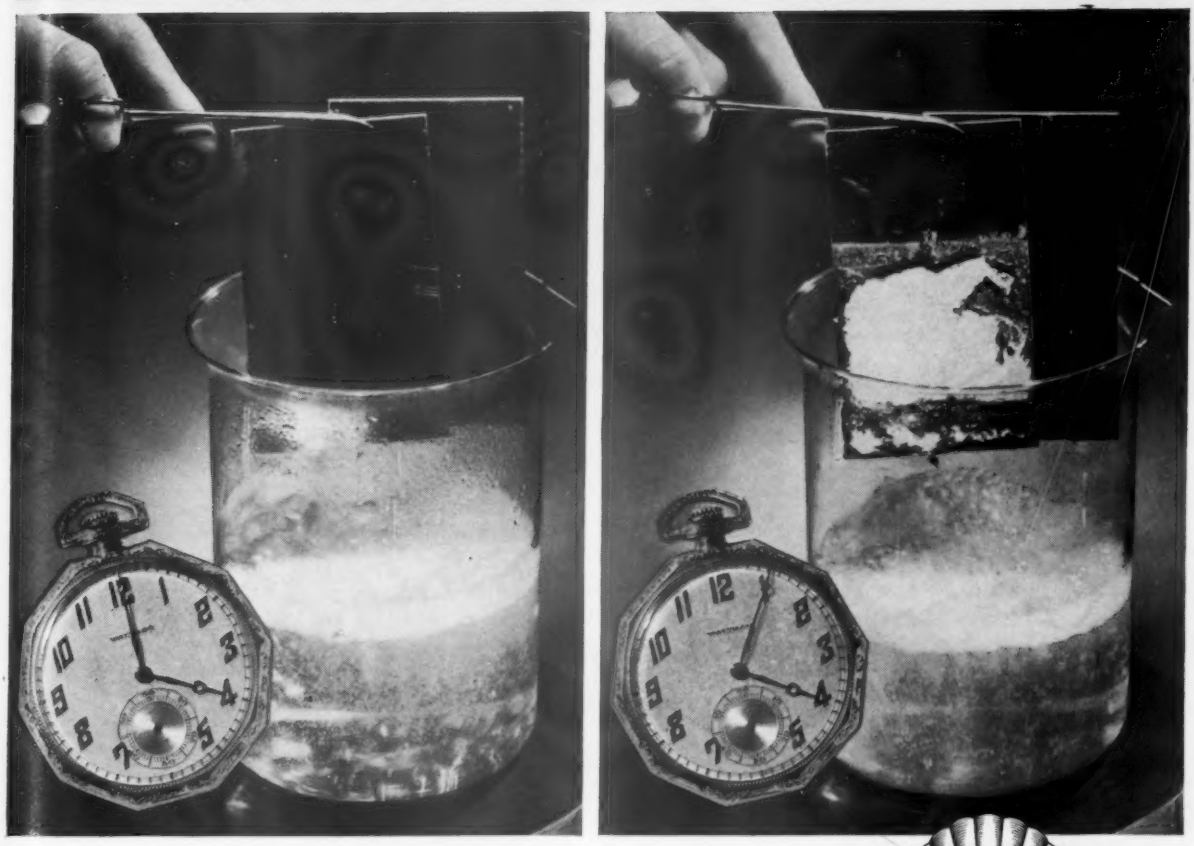

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Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 42 JUNE, 1952 NO. 6

NEXT ISSUE

In the May issue it was indicated that an article on vinyl solution and dispersion coatings would appear in the June issue. However, due to circumstances beyond our control we were unable to run this article in June, and we are pleased to state that it will appear in July.

Published Monthly by
Powell Magazines, Inc.
Executive and Editorial Offices
855 Ave. of the Americas
New York 1, N. Y.
BRyant 9-0499

JOHN POWELL, *Publisher*
ANTHONY ERRICO, *Editor*
A. L. BENDER
Production Manager
G. J. TEIR
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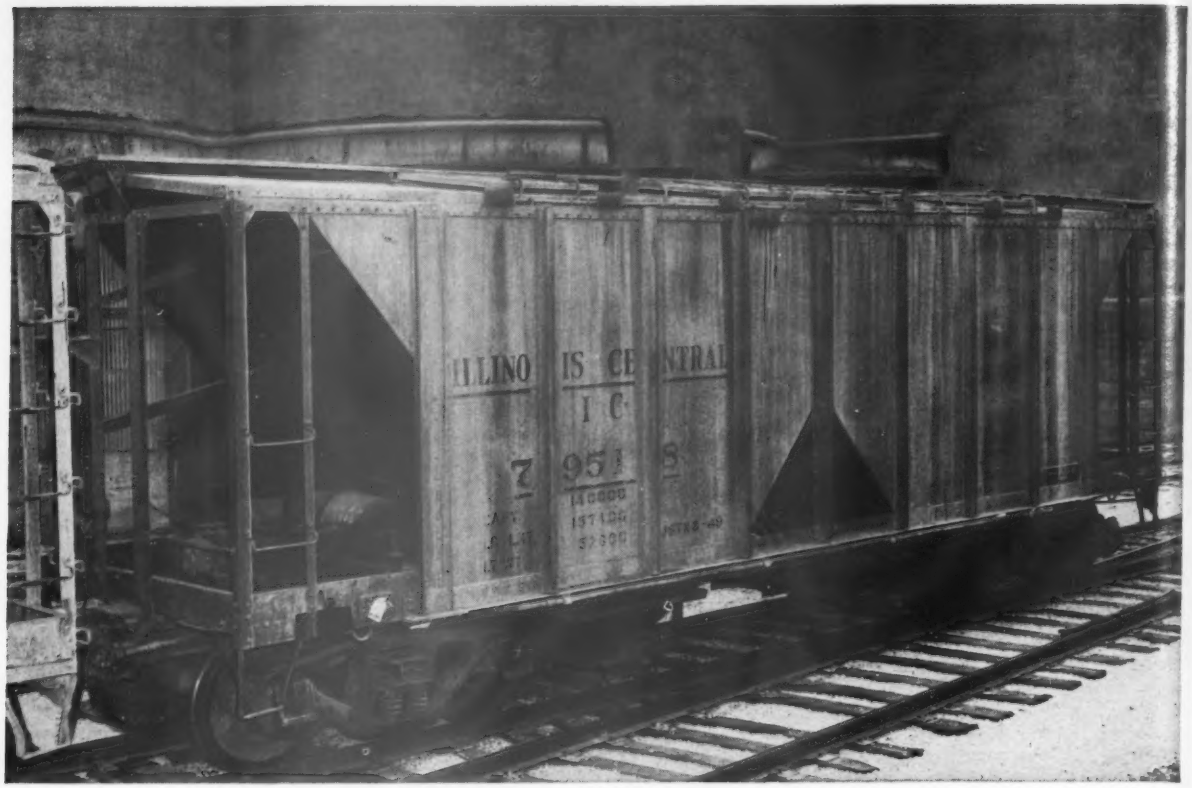
PAINT and VARNISH PRODUCTION is published monthly at Easton, Pa. by Powell Magazines, Inc. John Powell, president; Ira P. MacNair, vice-president and treasurer; Alice L. Lynch, secretary. Entered as second class matter at Post Office at Easton, Pa., Jan. 30th, 1952, under the Act of March 3, 1879. Subscription rates: United States and Possessions, $3.00 a year, $5.00 for two years, $10.00 for five years. Canada, $4.00 a year. Pan American Countries, $4.00 a year. All other countries $8.00. Editorial and business office: 855 Avenue of the Americas, New York 1 N. Y. BR-9-0499.



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Editorial Comment

Consumer Influence

THE AMERICAN paint industry, whose arpidly growing sales volume has placed it in the billion dollar class, stands on its own feet and should no longer be classified in financial circles as an adjunct to the building industry, "William C. Dabney, president of Devoe and Raynolds Co., Inc., told members of the New York Society of Security Analysts at a recent luncheon.

Mr. Dabney pointed out that gross sales by more than 1300 paint manufacturers have soared from 443 million dollars in 1940 to one billion, 375 million dollars in 1951, an increase of 206.3 per cent.

A relevant point brought out by Mr. Dabney is the fact that only a small percentage of total sales stemmed from new construction. The overwhelming volume of purchases from the paint industry's "trade sales" or "canned goods" divisions were made by home owners who, for the first time in 1950, outnumbered renters in the United States.

"The 1950 census figures showed that, for the first time, owners of occupied dwellings exceeded renters," Mr. Dabney said. "Between 1940 and 1950, the number of home owners increased 54 per cent, until there are now more than 23 million of them. This fact has afforded and continues to afford the paint industry the greatest opportunity in its history."

Describing these 23 million home owners as "first class customers or prospects," Mr. Dabney declared that most of them "buy paint on a systematic basis in order to enhance the appearance of their property and at the same time to protect it from deterioration, and, hence, to safeguard their investment."

"With the growth in the number of home owners" he added, "there has been a corresponding expansion in the market for paint manufacturers during the past ten or twelve years. This fact alone — the job of home maintenance and improvement — has long since lifted the paint industry from the status of an adjunct to the building and construction industry."

Also, there has been an increasing demand for paint products which home owners could apply themselves. Obviously, this trend is attributed to high labor costs, increased taxes, and today's high cost of living. Last year, thirteen out of every twenty cans of paint were bought by the amateur painter.

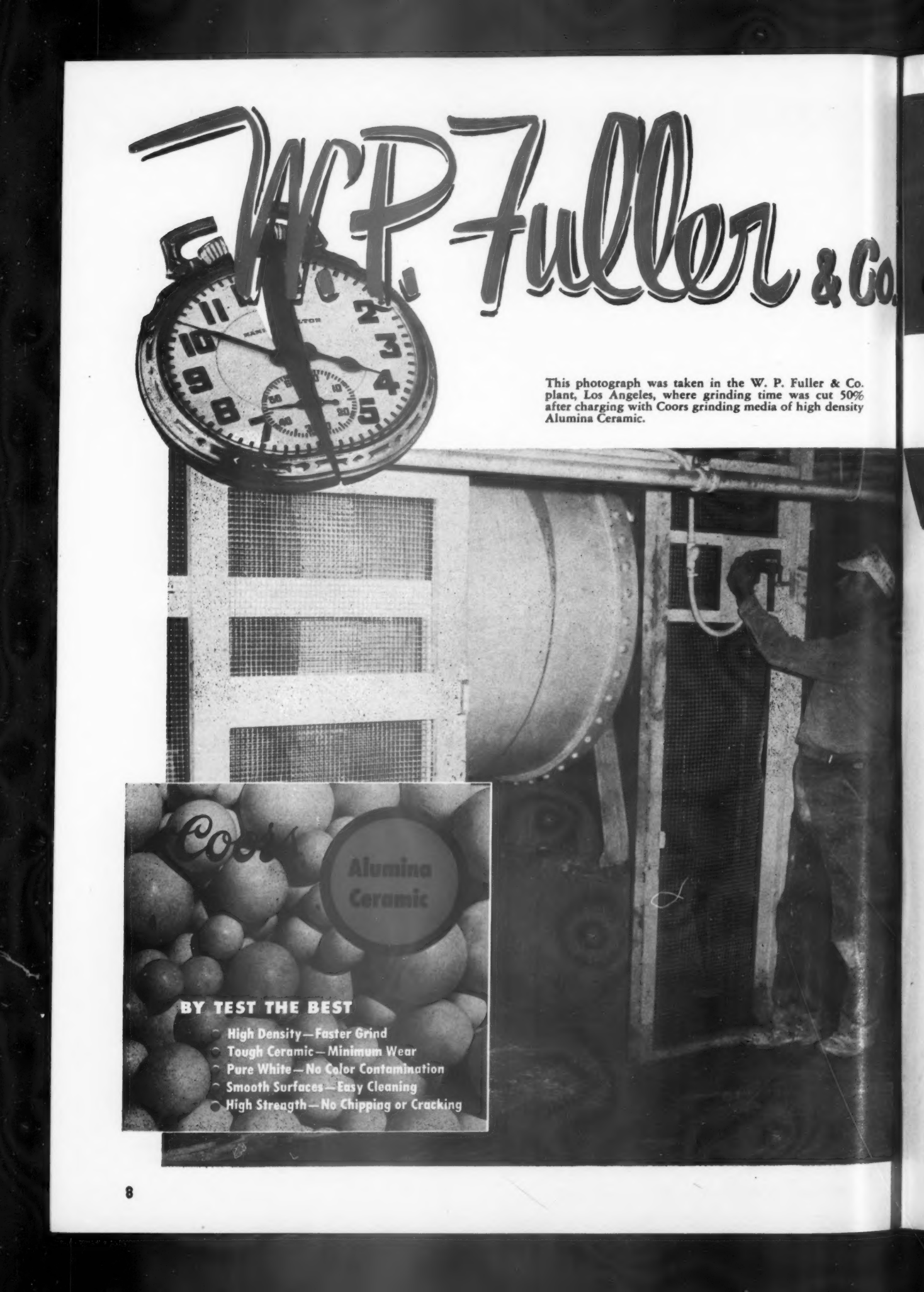
With this trend, the paint manufacturer has recognized the importance of formulating paints which have easy application characteristics and meet the demands of the consumer.

The average individual wants a one coat system which is odorless, dries rapidly, has good washability, mar-resistant characteristics, etc. And in the search of making the job as easy as possible, he may use a roller or a pressure roller instead of a brush.

As a result of the more demanding attitude of amateur painters, the job of formulating coatings becomes more complex. A case in point is the formulation of the popular deep tone flats. Properties looked for in paints by the consumer are good mar-resistance and washability. Much to his chagrin, he finds that these properties are not found in deep tones. As any formulator knows, if you want a deep tone finish, you must forego washability and mar-resistance.

The use of new application devices such as rollers and pressure rollers have imposed leveling problems which the formulator must always consider. Often a desirable feature of a paint may mean an inferiority in other characteristics, and it behooves the formulator to reach a happy medium in performance properties so that the consumer is satisfied.

In this regard, one cannot overlook the significant achievement made by latex-base paints. It is true that the acceptance and demand of such paints were primarily due to the excellent advertising and promotional program conducted by firms in this field. But credit for this technical development goes to the paint chemist, who with the knowledge of emulsion copolymerization was able to synthesize tough and durable latices, which by new ideas of formulation and processing could be adapted in the manufacture of water-thinned paints with properties most appealing to the consumer.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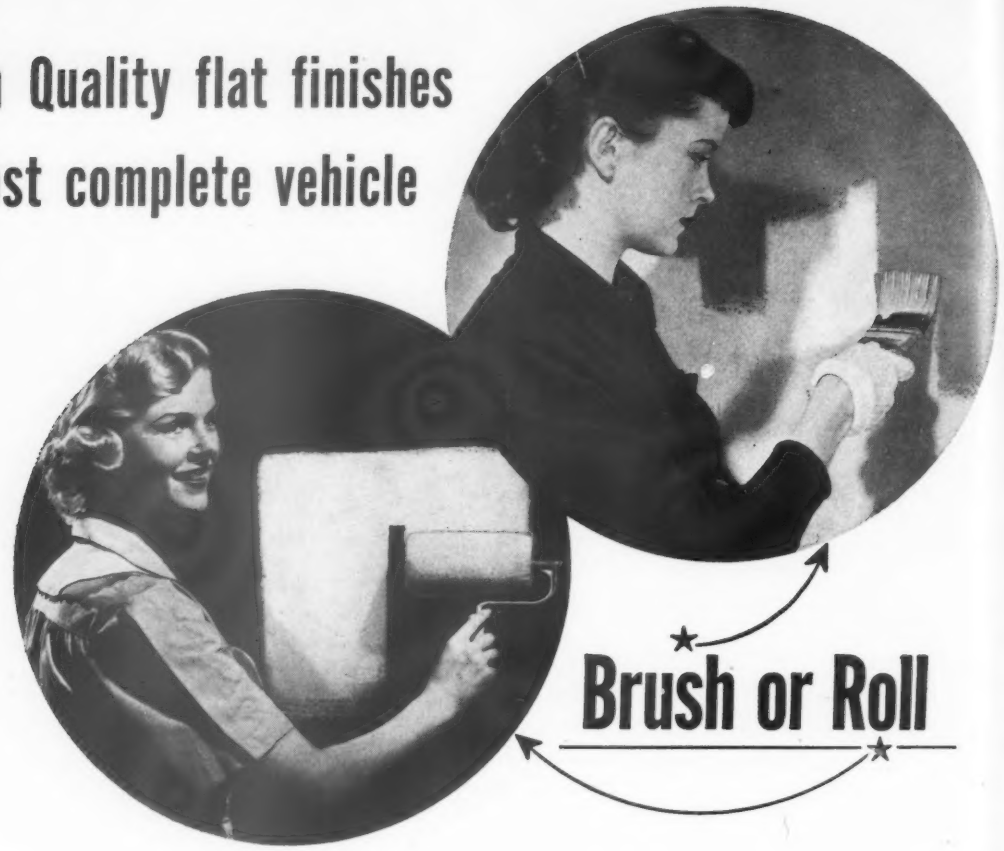

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Characteristics of Flatting Agents

USE OF SYNTHETIC SILICA IN HIGH QUALITY LACQUERS

By LUTHER O. YOUNG
Research and Development Div.
Davison Chemical Corp.

FLATTING agents are incorporated into surface coatings, synthetic leathers, synthetic fabrics and plastics to make their surface appearance more attractive. In addition to a large use in the furniture industry, there are also applications in military finishes, interior decorative coatings, synthetic leather coatings, certain metal finishes, and synthetic fabric coatings, all of which for necessity's sake or for appearance's sake are more useful with flatted surfaces. Due to the complexity of lacquer compositions and the highly competitive nature of the paint industry, a synthetic flatting agent made principally for this application is most attractive and desirable.

Use in Lacquers

THE high gloss usually associated with clear lacquer finishes is not satisfactory for some applications. In the furniture industry, a high gloss finish is seldom desirable, especially for expensive furniture. Traditionally, the highest quality merchandise presents a rich appearance due to its semi-dull, satiny finish. This association of appearance with price is a result of the once costly treatment of the finish necessary to give the desired richness which involved hand rubbing the clear finish with some abrasive, such as pumice, mixed with oil or water. The effects of a rubbing treatment are gently abrasive, causing a slight roughness in the surface of the finish and renders a glossy surface dull or flat. Although hand rubbing is still practiced to some extent in the furniture trade, the same effect may now be obtained by incorporating a flatting agent in the lacquer finish. This addition of a flatting agent produces a surface condition which roughens the film microscopically and produces the same effect as hand rubbing. Consequently, flatting agents offer an inexpensive means of producing an expensive finish.

A flatting agent may be defined as a material which reduces the luster of surface coating materials. When formulated in a coating it will produce a surface condition, breaking up light reflection and reducing the luster of the film. In the case of siliceous materials, surface roughness too slight to be obvious is responsible for diffusion of the light rays and for creating the matte or satin-like appearance of the film. This roughness is caused by particles of the material protruding very slightly above the surface of the film. Flatting agents may be natural or synthetic materials. The natural materials are gums, resins, and siliceous materials such as diatomaceous earth, talc, etc. The synthetic agents are finely divided synthetic silicas and metallic soaps.

Synthetic Silicas

PRODUCT uniformity controlled to meet specific demands is an advantage enjoyed by the synthetic silicas. One of these recently introduced is Syloid 308 fine silica. This synthetic silica follows the

Table I

	Synthetic Silica	Natural Occurring Products	Natural Occurring Products Plus Organic Surface Coatings	Metallic Soaps
Economic Efficiency	1	1	2	3
Flatting Efficiency	1	4	2	3
Grinding Time	1	2	1	1
Film Clarity	1	2	3	3
Temperature Stability	1	1	2	3
Resistance to Burnish	1	2	3	3
Settling Characteristics	2	2	2	1
Mill Base Concentrations and Stability	1	1	2	3
Uniformity and Purity of Product	1	3	3	2

Rating performance of various flatting agents.

conventional line of silica gel manufacture, but it is not identical nor similar in many respects to the desiccant grade of silica gel or to the catalytic grade of silica gel.

Silica gel is a manufactured form of silicon dioxide, having an extremely coarse and open structure. It was developed by Dr. Walter A. Patrick, Professor of Physical Chemistry, Johns Hopkins University, during World War I, while working with the United States Chemical Warfare Service on the investigation of materials for use in gas mask canisters. Since that time, the product has been perfected by continued research of the technical organization of The Davison Chemical Corporation. It is made by mixing predetermined concentrations of an acid such as sulphuric acid and a soluble silicate like sodium silicate (water glass), and allowing the mixture known as a hydrosol to set to a jelly-like mass called hydrogel. The product takes its name from its condition as a colloid at this stage of its manufacture. After setting, the hydrogel is broken into small lumps and thoroughly washed: The washed hydrogel is then dried, crushed, and screened to the desired particle size.

The nature of the internal structure of silica gel is not known exactly. Theories advanced by physical chemists regarding the structure have resolved into several conceptions. According to one group, silica gel might be described as being a body of sub-microscopic spherical silica particles piled together in a homogeneous mass similar to a pile of lead shot. Another school is of the opinion that it can be considered to be a mass of strands of silica intertwined indiscriminately and uniformly in all directions after the fashion of fibers in a ball of raw cotton. Since the pores or capillaries are formed by the juxtaposition of silica particles, they are not of the same diameter throughout their length and are probably shaped like a wedge. Silica gel made according to the above process may have a surface area of 90,000 sq. ft. per cubic inch, such as is often found in the desiccant grades of silicas, or it may have a very small surface area approaching that of fine size solid particles depending upon the processing variables during its manufacture. Syloid 308 has a small surface area compared to the desiccant or adsorptive grade of gel. It is a stable item of commerce not adsorbing moisture from the atmosphere nor being reactive to the various organic components with which it comes into contact.

Selection

MANUFACTURERS of flat lacquer finishes have a large number of problems to consider in the selection of the proper flatting agent for their use. The most commonly occurring points that must be decided upon are listed in the Table I along with the rating of the performance of each of the various types of flatting agents. The best performance is indicated by the numeral "1"; numeral "2" the next best, etc. A classification lower than "1" does not necessarily mean that the flatting agent is unsatisfactory. The method of evaluation and the conclusions derived are the result of research in the laboratories where this material was developed.

Economic and flatting efficiency characteristics are closely related. Economic efficiency has to do with the amount of flat surface one can obtain from a certain unit cost of flatting agent, while flatting efficiency is concerned with a comparison of the amount of flat surface obtainable on a pound basis of one flatting agent to the other. Figure 1 shows the flatting efficiencies of 6 competitive flatting agents falling into the 4 main categories listed in the Table II. These curves show the degree of flatness which may be obtained by the addition of a specific quantity of flatting agent to a clear lacquer.

It is obvious that the same degree of flatness may be obtained by

Flatting efficiencies of various flatting agents (see fig. 1)

Table II

Code for Efficiency Curves

Curve No.	Material	Unit Cost Ratio
1	Natural occurring product plus organic coating	1.00
2	Metallic Soap	2.41
3	Metallic Soap	2.41
4	Metallic Soap	2.70
5	Organic Resin	2.77
6	Synthetic Silica	3.24
7	Syloid 308 fine silica	2.65

more than one agent provided the proper quantities are added to the lacquer. On the basis of total lacquer solids, if a 25 gloss is desired, it can be seen from these curves that a synthetic silica such as No. 7 (3%) would do the same amount of flatting as 8.6% of the metallic soap No. 4. At this same level of flatness, 3% of No. 7 will do what 9.8% or No. 1 will do. It is observed, therefore, that flatting agents do vary widely in their ability to produce flatness in a lacquer film.

If, instead of a percentage based on weight, one uses a unit cost of flatting agent and plots these values against the Gardner 60° spectral gloss readings, a configuration of curves is obtained as illustrated in Figure 2.

This series of curves is called the economic efficiency of various flatting agents, the same list as in figure 1, except the degree of gloss is plotted against the unit cost of the flatting agent.

There has been some shifting of the curves and where flatting agent "1" was originally the poorest in flatting efficiency, it has moved over next to the best in amount of flatness obtained per dollar cost. However, greater film loading is required since No. 1 requires over three times the percent by weight as is needed for No. 7 to attain a 25 gloss. This means film clarity and other general film characteristics are sacrificed as well as a loss in mill room efficiency since larger quantities of mill base are required.

A study of figure 2 reveals that although the organic flatting agent No. 2 has a higher flatting efficiency than No. 1, the natural occurring product with an organic coating, the lower price of the No. 1 product actually makes it more economical to use in flatting a clear lacquer. A further study of figure 1 and figure 2 shows also that the synthetic silica No. 7 has the highest flatting efficiency of any of the products and maintains this superiority even on a cost basis. The metallic soaps all stay within a rather close range of each other in both the efficiency and economy graphs. These examples are illustrative of the cost versus efficiency relationship which must be carefully considered in order to determine the maximum economy.

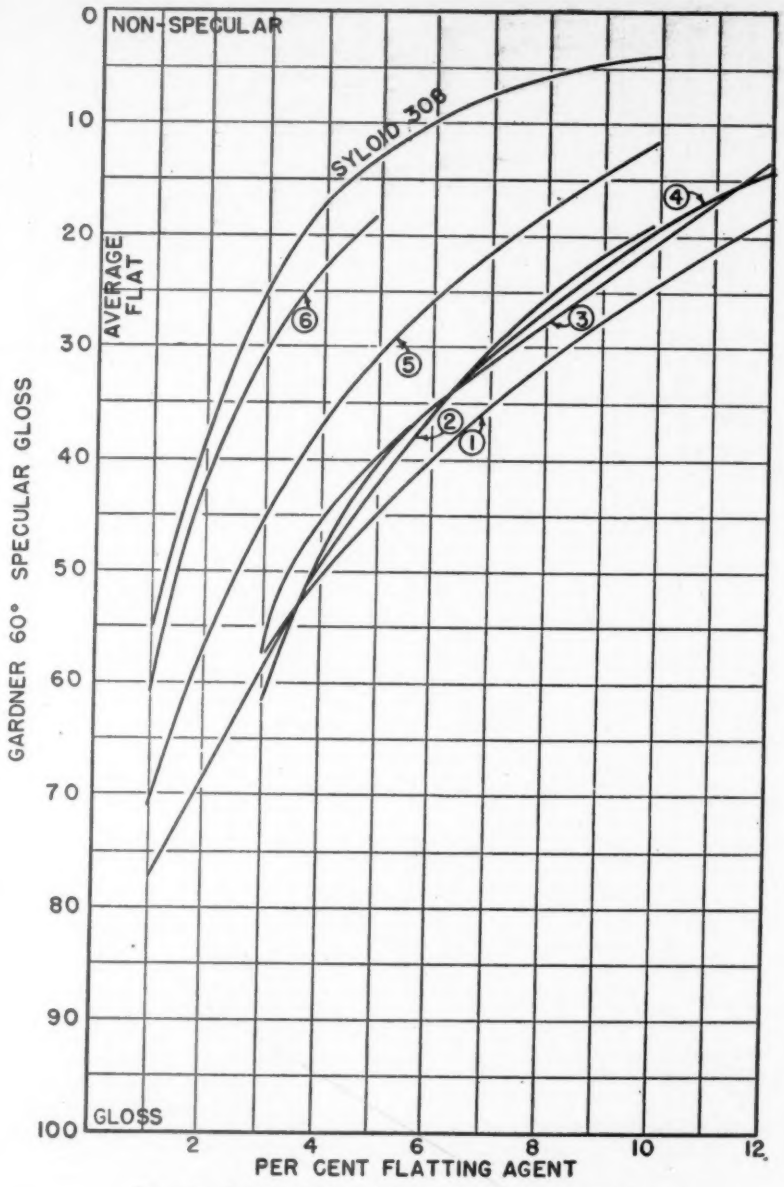

Figure 1. Relative flatting efficiency of other flatting agents

Particle Size

VARIATION in flatting efficiency and grinding time is closely allied with differences in density, oil absorption of the product, and especially with the particle size of the flatting agent. A survey of a wide segment of flat lacquer manufacturers showed that no characteristic behavior seems to be as varied as the length of grinding time for flatting agents. Manufacturers generally ball mill flat mill bases and this process varies anywhere from 8 to 60 hours. Roll mill techniques also vary widely in the number of passes and in the make-up of the grinding vehicle. A flatting agent such as fine silica which has been sized to the correct particle size for optimum performance requires only dispersion in the vehicle itself or in some component part of the vehicle. Certain manufacturers accomplish this with a high speed mixer and do not use any milling equipment. The dispersal of the flatting agent into the vehicle is variable, being easy or difficult largely depending upon the particular vehicle and the particular flatting agent concerned. A

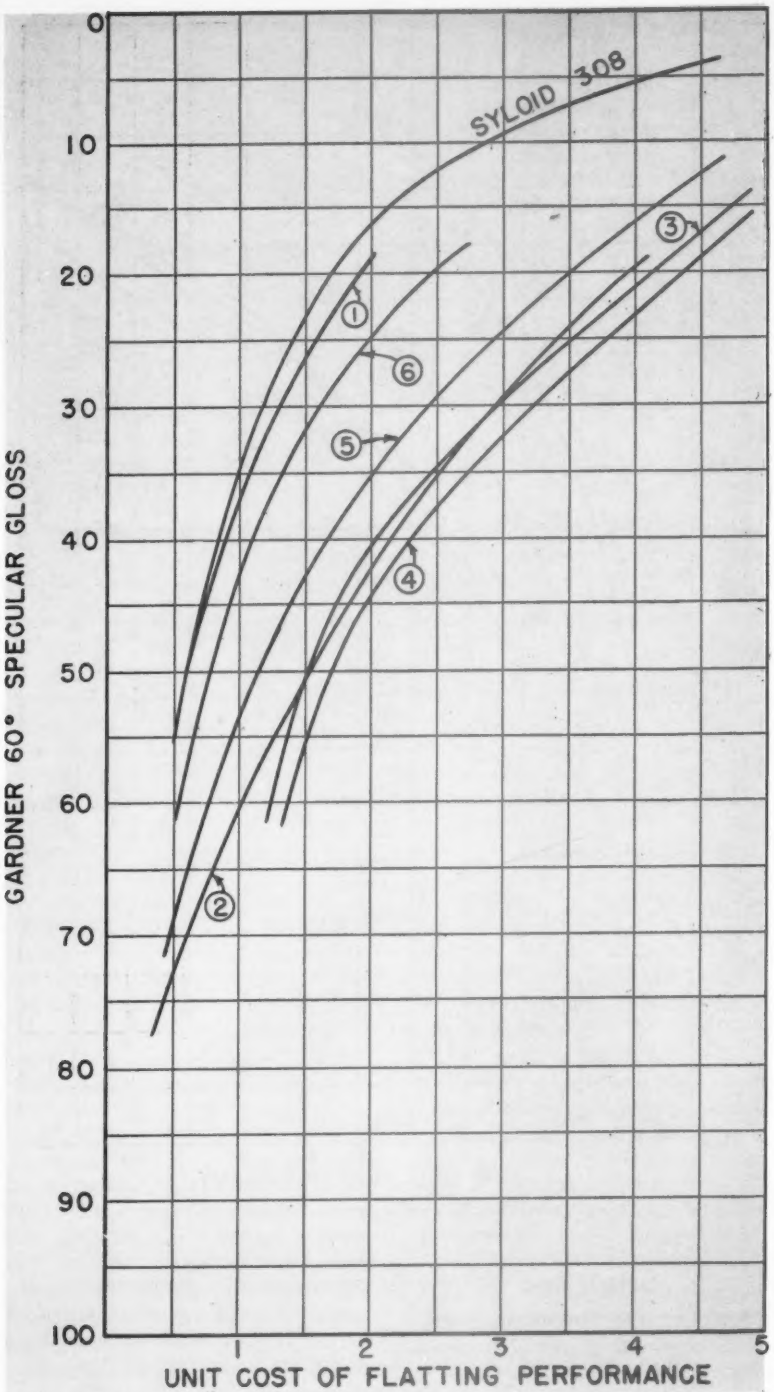

Figure 2. Relative economic efficiency of flatting agen ts

rather unusual and unexpected relationship exists with solid flatting agents between the particle size and the flatting efficiency. Figure 3 illustrates this relationship and indicates that for flat lacquers of spraying viscosity a product having a particle size of 6 to 14 micron diameter gives the highest flatting efficiency.

It is further noted from a study of this graph that with particle sizes larger than the 6 to 14 micron size, as well as with particle sizes smaller, that the actual flatting efficiency is not as great. This phenomenon is also related to film thickness and film composition. A thick varnish film requires a somewhat larger particle size but shows the same general relationship between size and flatting efficiency. This graph was made by selecting very narrow ranges of particle sizes and testing them in a standard manner in the same identical lacquer vehicle. Based on information shown in this curve, it is obvious that flatting agents manufactured to the proper particle size require no grinding in a ball mill, but only dispersing into the desired vehicle. It also means that one pound of a flatting agent made with the maximum number of particles in the ideal particle size range will give a much greater flatting effect than products not manufactured in this manner.

Interpretation of Data

THE above three figures, 1, 2, and 3 list fundamental data about flatting agents that have broad application to the flat lacquer field. Many practical uses can be made of these data in addition to those cited, especially if one considers some of the other chemical and physical characteristics of the individual flatting agents themselves. For example, where mill room capacity is limited or where greater production is wanted from the same equipment, one would choose No. 7 over No. 6 because 2½ times more flat lacquer could be produced from the same facilities. This is true because No. 7 produces less thixotropy, is somewhat more dense, and the mill base disperses readily in the let down without seeding.

In the case of films such as oilcloth table covers, window shades, or similar products where long life, flexibility, and washability are wanted, it is often a problem to get the desired surface flatness without using a high loading of an inert filler in the film. When using a high efficiency synthetic silica flatting agent, film loadings of approximately 20% of those used for certain of the natural occurring filler give the desired flatness and other characteristics. The higher percentage of vehicular solids that is possible when using the synthetic silica promotes longer life, greater

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Protective Coating Requirements By the Quartermaster Corps

THE Quartermaster Corps purchases little paint in itself and this is usually for some minor maintenance use. However, its interest in all of the miscellaneous items purchased by the Quartermaster for use by the Army includes the necessity of having adequate finishes for such items. Therefore, the Quartermaster Corps is faced with the general problem of what is the best coating for use on the Quartermaster Corps' items.

This problem is complicated by the fact that the finishing requirements of any of the items must allow for all of the possible methods of coating and application being utilized in the entire industry. As a result, the Procurement Directives require constant study and checking to insure that an appropriate coating is included in proposed purchases. This includes consideration being given to the availability of materials, the economic situation, and the facilities of the prospective contractors.

For items of strictly military use, a high quality finish is desired to insure satisfactory performance of the item. For items of a civilian nature, such as house furnishings, a good commercial finish is adequate. During times of stress, when specifications are amended frequently because of the rapidly changing raw material supply picture, the practice has usually been to preserve the quality of the finish for military items as much as possible. The coatings for the civilian type materials, however, are usually permitted to follow along with that of actual civilian practice.

Much of the work being conducted by the Quartermaster Corps is carried out under contract at various industrial laboratories. When adequate laboratory facilities are made available, however, by construction of the contemplated Quartermaster Corps' Research Laboratories, a greater portion of the research will be done by the technical staff of the Corps. The present laboratory for Protective Coatings is located at the Philadelphia Quartermaster Depot and, at present, only specific problems of protective coatings for military equipment are being worked on.

Research Programs

IN the early part of World War II the "Drum, Inflammable, Liquid (Gasoline) 5-gallon", commonly called "Blitz" cans, were lined with an organic coating to prevent corrosion and prolong the life of the containers. Those linings were based on a pigmented phenolic resin-china wood oil varnish. While they were excellent in chemical resistance, combat experience showed that under war-time conditions of service, these coatings did not have adequate impact resistance and flaked from the surface when the cans were dented or otherwise abused. As a result of field experience, the lining of new cans was discontinued about the middle of 1943 and has not been resumed to date.

Since a lining is desirable both in terms of prolonging the service life of the can, preventing the rust formation which contaminates gasoline with foreign sediment, and to make the gasoline container suitable for other storage, the Quartermaster Corps undertook a program to investigate commercially available materials for this application.

Under a research contract with an industrial concern, formulations and methods of application of nonmetallic interior coatings are being studied or developed. This study consists of an evaluation of existing coating material as well as modification of existing ones. Metal pretreatments, methods of application, spraying devices and methods of modifying or extending the use of these are being studied under the program.

The type of coating that is desired for the interior of the drums is one that will resist the attack of petroleum fuels (high octane) and jet fuel, and will not contribute to the increase in gum content of the gasoline. It must be capable of withstanding an ambient temperature range of -65 F to plus 125 F while in use (for four hours of strong sunlight) and a temperature of -80 to plus 160 F while in storage. The coating materials shall have a service life of approximately five years.

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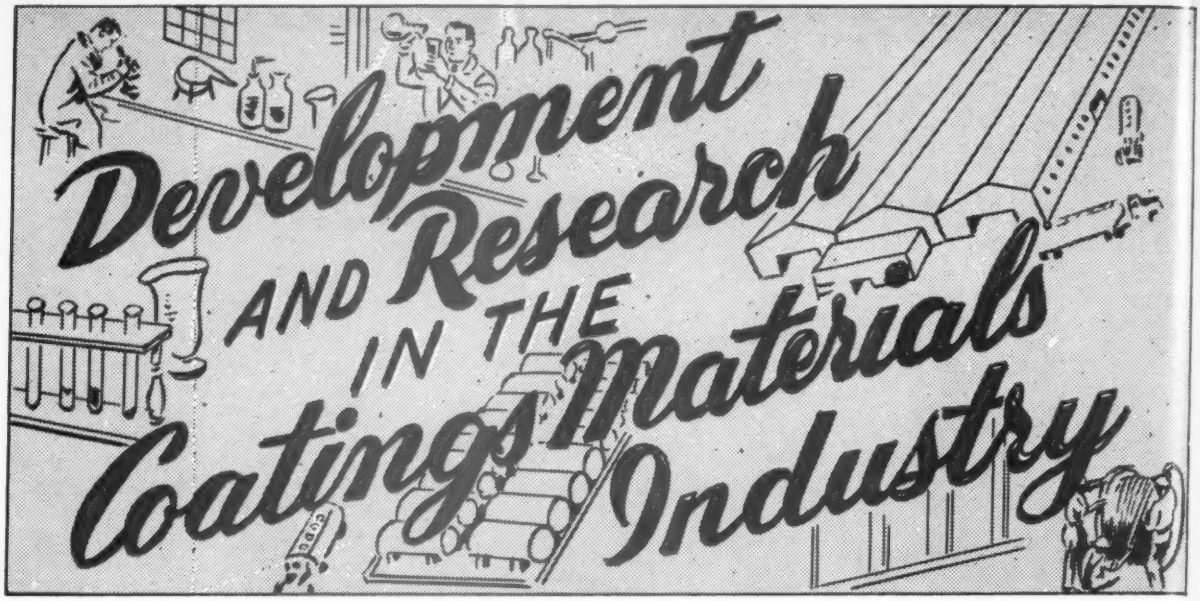

PART VI

DEVELOPMENT TECHNICS APPLIED TO VARNISH AND VEHICLE PRODUCTION

By
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Alkyd Products Engineering
General Electric Co.

THE impact of new production — new in volume — new in price — new in performance — this is the end result of the operations of the profit-getting-team.

The results of research, development, advertising, sales and other service functions do not add up to net dollars gained, unless products are manufactured and shipped to customers.

Have you observed a new trend in the thinking in production departments responsible for varnish and vehicle manufacture? — A conscious trend away from long established but haphazard production procedures — away from historical survivals of confused scheduling and partial controls? Men who lead production in varnishes and vehicles now set up to consistently re-examine the methods they use in processing, control and scheduling. They take steps to readjust their operations as soon as they have available new processes, more significant controls, or facilities for greater coordination with co-dependent departments.

Many production situations requiring sound decisions confront varnish and vehicle manufacturing groups today.

Are any great processing economies possible? Should continuous production be considered seriously? Will new equipment operate at a net savings? Is vertical integration a genuine advantage?

Application of Development and Research Tools to these and similar questions are discussed in Part VI of this series..

The trend is to apply research and development methods to the production phase of varnish and vehicle manufacture.

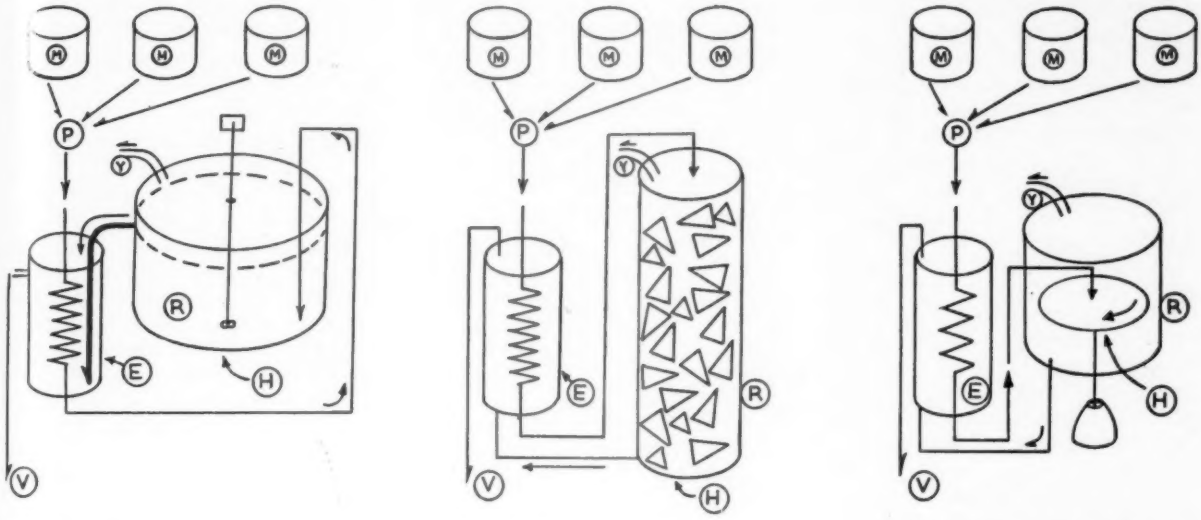
The idea that a production department should itself do research and development on production is quite new in the coatings materials industry.

But in a limited way and without definite direction, most companies do carry out a form of production development. Wouldn't you consider that process development is going on whenever you "try-out" a new idea? Don't some

Editor's Note: This discussion is based on the varied personal experiences of the author. The facts and examples cited do not necessarily represent the practices of any single company. The processes referred to are cited as informational examples only and not necessarily as recommendations for use.

F OW CHART SHOWING COMPARISON OF POSSIBLE
S STEMS FOR CONTINUOUS PRODUCTION OF VEHICLES

KEY:
E - HEAT EXCHANGE UNIT.
H - PRIME HEAT INPUT.
M - RAW MATERIAL.
P - PROPORTIONING PUMP.
R - REACTOR.
V - FINISHED VEHICLE.
Y - VOLATILE PRODUCTS.



STABLE STATE REACTOR — TOWER REACTOR — ROTATING DISC REACTOR

FIGURE I

try-outs lead to advantages gained and improvements made?

"Trying-out" ideas can become a part of a pattern of the natural march of events. When this happens, and when each "new idea" is not a separated event but a detail of information in a structure of relationships, then you have "production development" in operation.

The techniques we have discussed so far in this series as the main techniques of research and development may be briefly abstracted into the major steps of:

1. Collecting reliable and sufficient information.
2. Organizing the information into a verified structure of relationships.
3. Precision use of the information to fill needs.

The complicated and often perplexing problems related to production can be most effectively handled by using the above approach.

Is the coatings materials industry actually using this method today? Let's consider some examples —

The growing use of the uniphase technique of varnish and vehicle production results from the conscious application of precision research and development techniques over the past 10 years.

Using the uniphase technique, many vehicle producers manufacture vehicles directly from basic chemical raw materials without the necessity of using previously prepared "synthetic resins".

Before the introduction of the uniphase technique, varnish-making was the second step in a two-step operation. The first step consisted of a resin manufacturer combining ingredients, such as rosin and glycerine or pentaerythritol with maleic anhydride or a phenolic condensate. This necessitated that the resin manufacturer add to the raw materials charges for: heat, package, process control, overhead, direct labor, shipping and inventory. At this point the ingredients formed an article of commerce known as a synthetic resin. In the second step, and in another plant, the vehicle and varnish manufacturer combines the synthetic resin with drying oil, solvent and metallic drier. During this step the resin was again heated, process controls applied and charges made for heat, package, control, inventory and direct labor. These charges against the step carried out by the varnish manufacturer were, in fact, duplicates of the charges against the step carried out by the resin manufacturer *on the same material.*

Uniphase Processing

THE uniphase development started from the question that "Can the ingredients for the resin and the ingredients for the varnish be compounded together in one step and result in a satisfactory product at a savings in total cost?"

The uniphase varnishes and vehicles are now a commonly accepted fact. At equal finished product performance, the uniphase products are much lower in cost than corresponding conventional varnishes.

The uniphase technique also enables the production of different, more versatile and better vehicles than could be produced within the limitations of the conventional varnish and vehicle cooking technique.

The additional advantages gained were:

(a) The ratio of polymerizing dibasic acids to the total vehicle ingredient could be increased in the uniphase varnishes far beyond that possible in the conventional varnishes without gel formation. This, in turn, means that uniphase varnishes can be made to possess the characteristics of —

Very rapid dry.

Very rapid viscosity increase during processing.

Under these conditions soya oil becomes usable. Since soya oil is usually lower in price than other drying oils, cost savings can be achieved on the basis of the oil used, as well as on the basis of simplified processing.

(b) In conventional varnish and vehicle production, acid value is apt to increase during the heating without the possibility of control. In the uniphase procedure, the acid value is the prime control point. The process heating is continued until you reach a low enough acid value.

(c) Since uniphase processing is carried out under esterification conditions, you can incorporate into your composition a considerable proportion of tall oil acids. These acids become esterified and contribute to both the oil and resinous ingredients at a considerable savings in cost.

You can tell the idea of one stage varnish and vehicle production is quite new to the paint and varnish industry because it is referred to by a number of alternates and interchangeable with descriptive terms, such as (1) in situ varnish, (2) one-stage cooks, (3) esterification cooking, and (4) one-step ester processing.

A Processing Man's Decision

ANOTHER situation, far more complex in nature, confronts varnish and vehicle producers today. Whether he wants to or not, the manufacturer is making a decision on the continuous production of alkyd resins and oleo-resinous vehicles. Either he will initiate research and development on continuous production or he will wait until another manufacturer turns up doing exactly this. What reasoning will guide his decision? Let's examine some of the facts about each possibility.

Facts about today's batch production:

(a) Batch production is suitable for both small and large equipment.

(b) Batch equipment is comparatively low in cost.

(c) Dollar labor costs are high in relation to volume of material produced.

(d) Control consists of following the progress of the batch — it does not allow for continuous autocompensation and adjustment of final properties continuously.

(e) Individual batches differ. They must be accepted as different or go through a further extensive blending treatment.

(f) Slow up-heat and slow cooling limit the range of products that can be formulated from raw materials that are known to be capable of making more versatile products than batch equipment will permit us to make.

Batch versus Continuous Production

TRANSLATING these facts into their production significance, you see the batch process is most suited to job-order production. In this case, batch processing has the advantage of low inventory requirements, low initial investment costs, discontinuous procedure and rapid product-to-new-product change. Although the process of batch operation can be refined, organized and systematized so that it appears semi-continuous, the above-cited disadvantages continue to show up.

Anticipated view of continuous production: (The listed results will be available when sufficient development work is extended to make continuous production a reality.)

(a) Higher yields from raw materials taken than by the batch process.

(b) Improved performance characteristics — better color, better uniformity, more uniform molecular weight distribution, improved drying and new combinations of available raw materials.

(c) Low labor cost in relation to pounds of material produced.

(d) Better control of the viscosity, solubility, compatibility and other final product specifications.

(e) Long runs of a single material are necessary.

(f) Probable high initial cost requirement.

(g) Careful standardization of starting materials is necessary.

Translating these facts into their production significance, you see the continuous process will be most adaptable to production for volume markets where low cost production for high volume sale is necessary and where a stable enough situation prevails to warrant high capital investment.

This brings out the cluster of questions: What market does the vehicle and varnish manufacturer actually produce for? Will continuous production improve position on any of these markets? Does a mass market for vehicles actually exist?

A summary of the vehicle market can be briefly mapped as follows:

TYPE A — Captive vehicle producer supplying a paint manufacturer primarily handling a mixed line of products.
Class of Production: Short to medium length runs — many diverse items — flexibility prime requirement.
Probable Optimum Production Arrangement: Batch operation.

TYPE B — Captive vehicle producer supplying a paint manufacturer primarily producing architectural enamels.
Class of Production: low cost is prime requirement — few items — highest performance and uniformity requirement.
Probable Optimum Production Arrangement: Continuous operation.

TYPE C — Vehicle producer selling primarily to manufacturers of industrial finishes.
Class of Production: short runs, many items.
Probable Optimum Production Arrangement: Batch operation.

TYPE D — Vehicle producer selling primarily to architectural paint manufacturers.
Class of Production: long runs few items, low cost of paramount importance, uniformity essential.
Probable Optimum Production Arrangement: Continuous operation.

TYPE E — Vertically integrated vehicle and alkyd producer sales to a mixed market containing —

a. Mixed industrial architectural and utility items of moderate volume.
b. A few large volume items (industrial)
c. A few large volume items (architectural)
d. A number of medium volume items for non-coating uses.

Class of Production: A consolidation of many businesses.

Probable Optimum Production Arrangement: Operation of both continuous and batch production according to the individual and product concerned.

Having this viewpoint on the markets where your vehicles are actually going, it is easy to decide that equipment must be developed to meet a *specific* requirement. Design to fit into a general requirement will not accomplish fundamentally advantageous production.

Continuous Production Set-Ups

LITERATURE reports indicate that three different types of continuous processes for the manufacture of alkyds and vehicles are now under consideration and in various stages of research or development.

These approaches to continuous operation appear to be —

1. The stable state method. In this method vehicle ingredients are placed into a reaction kettle and the reaction is carried out until the vehicle solids are brought to completion. Then the product is slowly but continuously withdrawn from the reactor; but the heating is continued and unreacted ingredients are added at the same speed as reacted ingredients are withdrawn. This keeps the composition of the main reactor constant and is the origin of the name "stable state".

2. The tower reactor. In this method, they feed the mixed vehicle ingredients into a tower, packed with metal triangles and maintained at a suitable reaction temperature. The ingredients flow over the triangles forming a thin film where the reaction takes place rapidly. The finished product flows out the bottom of the tower.

3. The rotating disk reactor. In this method the mixed vehicle ingredients are fed on to a rotating disc enclosed in a suitable cover and maintained at a reaction temperature. The reactants flow over the surface of the disc in a thin film. They combine as they are forced centrifugally to the edge of the disc. The finished product runs off of the disc and is collected in a suitable receptacle.

Now which of these three methods should receive research effort? The Stable State Method is clearly the easiest to bring into practical utility from the standpoint of controls and equipment. It is quite questionable that it will produce the best products at lowest cost. On the other hand the development and refinement of the controls necessary to get the tower reactors or the rotating disk reactors into operation may require an extensive program.

Due to this chain of circumstance, the commercial utilization of a manner of processing new to the coating materials industry is dependent on the development of control technics.

Spotlight on Equipment

LEADERS among production men now consider that a process, raw material, and formulation, may be refined, improved and streamlined indefinitely, but if the equipment on which the operation is based is not adequate for the job on hand or if it is far inferior to corresponding equipment used by a competitor for the same purpose, then no amount of refining will improve the productive position. These men have (or should have) instituted a research tool which bears the title "Present-to-New-Equipment Balance Data".

This means a periodic cost and performance estimation for replacement of equipment. It means a cost and performance statement of existing status versus a status that could exist.

Using such a research tool (and this type of tool needs to be more adequately developed) your production group can judge when replacement will be most advantageous.

A simplified yet reliable system of cost estimate in a rapidly changing economy must be developed and the recognition that we now have available only rudimentary methods for doing this further emphasizes the need for expanded attention to this field of research and development applied to production.

The problem of estimating plant and operating costs on proposed new plants for new processes early in the course of laboratory research and development still requires further attention. Recent reports by *C. H. Chilton* (*Chemical Engineering, June 1952*) and by *R. S. Aries and R. D. Newton* (*Chemonomics*) outline current approaches.

Cost and Control

IN terms of the finished vehicle, raw material costs amount to over 60 percent. Often, material costs are in the range of 75 percent or 80 percent of finished product cost. The loss of a batch of material or any relatively small amount of material as a result of unreliable control greatly increases the costs applied to all production.

In the competitive struggle for low cost research on and development of reliable production control technics is rapidly becoming recognized as a main factor in assuring low production costs.

Control Development operates on a different basis from the haphazard control technics the varnish and vehicle industry is now in process of finding unworkable.

The old methods either accepted or rejected final products and were entirely unconcerned with cause.

The new control idea aims at detecting the causes for variations in product characteristics and pointing the means of correcting variations before loss occurs.

Control Development operators maintain final product inspection, but they do not confuse final product specification compliance with control criterions. Realistic control demands control at all steps.

The control Development operator proceeds as follows:

1. Reduce each fundamental phase in a process to individual control. (This is effectively done with the use of a control chart. The control chart shows each item of data observed concurrently with the average of similar previous data, the range of similar previous data and the variations in similar previous data. This work is based on the fundamental that a single unrelated measurement has little value in realistic control work.)
2. Sort the data obtained on each step. You find some steps require no further attention. You find other steps urgently require further attention.
3. Maintain controls on steps where control appears satisfactory — without this assumed information a process can suddenly go out of control in one place when efforts are being put in another area to solve difficulties which

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Copolymers in Surface Coatings

*A SYMPOSIUM**

J. W. McNabb

J. H. Daniel, Jr.

H. F. Payne

C. H. Parker

R. A. Calsibet

By ANTHONY ERRICO
EDITOR

AN interesting symposium on Copolymers in Surface Coatings sponsored by the Educational Committee of the New York Paint & Varnish Production Club was held on April 9th at the Polytechnic Institute of Brooklyn.

Chairman of the symposium was Henry F. Payne and speakers included:

J. W. McNabb, Kienle & Co. — Definition and Theory of Copolymerization.

J. H. Daniel, Jr., American Cyanamid Co. — Copolymerized Oils and Resins.

C. H. Parker, Monsanto Chemical Co. — Styrene Homopolymers and Copolymers in Emulsion Paints.

R. A. Calsibet, Bakelite Co. — Vinyl Copolymers, Organosols and Plastisols.

Mr. Payne made some introductory remarks in which he said,

"The fundamental concept of copolymerization has already produced some extremely useful coating materials, and many others may be expected because the possibilities are almost unlimited. The coating materials discussed in this symposium cover a wide range of properties yet only a relatively small number of reactive monomers are included. The principal reason these monomers are used is that they are produced at reasonable cost. The low cost, large volume production of styrene is the classical example of this statement.

However, polystyrene is practically useless as a coating material because of its relatively low softening point, solvent sensitivity and low solids in solution at application consistency. The incompatibility of polystyrene with drying oils and resins is a further deterrent to its use in coatings. At this point the copolymerization idea literally worked a wonder judging from the good propert ie and wide use of styrenated oils and alkyd resins. We are probably using the terms 'styrenated' and 'copolymerized' rather freely because our ability to analyze the products for true copolymers has not kept pace with their practical use. However, we can be reasonably sure that there is considerable interpolymerization because the products are mutually compatible.

The conditions under which styrenated oils and resins are produced favor the polymerization of styrene much more than the polymerization of the other components. If styrene polymer chains were attached at one or more points on an oil molecule the product would be a styrenated oil, but this may be designated an interpolymer rather than a true copolymer. By definition a copolymer is the result of the copolymerization of both or all of the reactive monomers present originally. Since the oil in the above examples is not polymerized, the product does not conform to the definition of a copolymer."

Mr. Payne then presented a brief resume of the various papers that were presented.

The following outline is based on notes taken by the author at the symposium and the technical literature of the companies whose material was presented. The complete text of the speeches will appear in the "Official Digest".

*This symposium was sponsored by the Educational Committee of the New York Paint and Varnish Production Club.

New developments and ideas covered by the various speakers in their respective talks provided the stimulus for a lively question-and-answer period which followed.

THEORY of COPOLYMERIZATION

Mr. McNabb defines copolymerization as a method of combining two or more unlike unsaturated organic molecules or monomers to form a chain polymer by addition polymerization. Examples are polyvinyl chloride-acetate, styrene-butadiene, and styrenated drying oils. It is through copolymerization that polymers with new physical and chemical properties can be produced. An example cited by Mr. McNabb was styrenated oils. In this particular case, styrene cannot be blended with a polymerized oil, but a copolymer can be produced from the respective monomers. This results in a product differing from both polymerized styrene and polymerized oil.

In discussing heteropolymers, Mr. McNabb, pointed out that this form of copolymerization takes place when one or more of the monomers is not capable of polymerizing alone. Copolymerization of styrene and maleic anhydride is an example. Even though maleic anhydride alone cannot polymerize, it combines readily with styrene to form a maleic anhydride-styrene heteropolymer.

Copolymerization reactions are carried out by three methods: 1. mass, 2. solvent, and 3. emulsion. In the copolymerization process, the nature of the product is dependent upon the ratio of the monomer and their relative reactivity.

Mechanism

According to Mr. McNabb, the mechanism of copolymerization involves three basic steps:

1. Chain initiation or activation;
2. Chain growth propagation; 3. Chain termination.

Normally chain initiation is produced by a free radical mechanism as a result of heat or a peroxide catalyst or both. This is a case of a copolymerization reaction proceeding through an ionic mechanism rather than a free radical mechanism. He then discussed the importance of the reactivity of the monomer in the copolymerization process and pointed out factors governing the reactivity of a monomer which are: 1) steric hindrance, 2) resonance stabilization of the free radical, and 3) polarity of the double bonds. He cited various cases in which these factors play a significant part during polymerization.

Drying Oil Copolymers

Mr. McNabb then discussed drying oil copolymers; particularly combinations of vinyl type monomers with drying oils.

In this type of a reaction, some are of the opinion that true copolymers are formed while others believe that the products are essentially solutions or dispersions of the vinyl type polymers in oils.

In the above case, the vinyl monomer may polymerize to a high molecular weight polymer so rapidly that little or no copolymer is formed, thus becoming insoluble in the oil.

Mr. McNabb stressed the importance of the structure of the oil molecule in this type of reaction. In cases where dehydrated castor oil is used, the conjugated double bond structure in the fatty acid radical forms addition products readily, and results in homogeneous products. Linseed and soybean oil have fatty acid radicals which are essentially non conjugated and therefore less reactive. Usually non-homogeneous products result with these oils unless special precautions are taken in their preparation. This may be accomplished by:

1. Addition of modifiers which retard reaction or polymerization.
2. Maintaining reactive vinyl monomers and oil monomer at low concentrations so that the law of mass action favors copolymerization rather than homopolymerization.

COPOLYMERIZED OILS AND RESINS

The last few years have seen a growth of a new type of coating material made by reacting a vinyl monomer with drying oil. These include styrenated oils, styrenated alkyds and the reaction product of cyclopentadiene and drying oils. More recently, fatty acids esters of Epon resins (reaction product of bisphenol and epichlorohydrin) have been styrenated in solution with styrene and with a mixture of styrene and alpha methyl styrene.

Properties

Mr. Daniel listed properties of styrenated products in coating materials and compared them with conventional products such as rosin modified alkyds.

Styrene acts as an up-grader for oils and alkyds by improving hardness, color, resistance to chemicals, drying characteristics, water and alkali resistance, and exterior durability.

Cyclopentadiene — drying oil copolymer exhibits similar properties to those of styrenated oils.

Styrenation of fish oils results in a film which is elastic, dries rapidly and free of after-tack.

Linseed-styrene copolymers are especially suited for varnishes, and as a fortifying agent in soft oils.

In comparing the properties of styrenated alkyds and regular alkyds, it was noted that the styrenated product had improved drying and hardness characteristics, higher resistance to alkali, acetic acid, and soap; and with baked systems better color retention. However, the presence of polystyrene in this alkyd combination shows lower resistance to mineral spirits and lower adhesion as compared to straight alkyds. Styrenated alkyds exhibit a decrease in mar resistance, which according to Mr. Daniel, can be relieved by the addition of a slip agent.

In outdoor exposure (18 months) white enamels formulated with styrenated alkyds dropped from a rating of 10 (best) to a 9 rating. Slight embrittlement and loss of adhesion was also noted.

The loss in the film property is chiefly decorative, such as the occurrence of bronzing, a decrease in color and gloss with such pigments as chrome yellows, iron blues and carbon blacks.

With chrome yellows, the styrenated alkyd products exhibit better gloss but slightly poor adhesion than straight alkyd systems. Toluidene red showed up very well in that there was no serious checking (this pigment usually shows rapid checking with other systems).

Solvent Sensitivity

Regarding solvent sensitivity, Mr. Daniel pointed out that styrenated alkyds are more susceptible to solvent attacks than non-styrenated alkyds.

Styrenated alkyds depend somewhat more upon solvent release and less upon oxidation and polymerization of the film to reach a hard and dried condition as compared to a regular oil-modified alkyd. Therefore, at certain stages in drying, the copolymer enamel is apt to be attacked by subsequent coats, which will cause wrinkling.

By proper scheduling of each application in multiple coating operations, this condition can easily be avoided.

In this connection, Mr. Daniel described some of the work conducted by the American Cyanamid Coating Laboratory on lifting in recoating operations.

Cycopol* resin enamels were evaluated for lifting tendency by first applying a single spray coat to steel panels and recoating at hourly intervals for a total of 8 hours; then at 16, 24, and 48 hours; and 1 and two weeks. Both black and white enamels were prepared with Cycopol Resin S101-1 and white enamel with Cycopol Resin S102-5. Thinners used were mineral spirits with longer oil resin and xylene when fast drying copolymers were used. Results are:

1. Systems containing Cycopol Resin S101-1 should not be recoated between three and 6 hours.

*Cycopol is an American Cyanamid Company trade name designating a series of styrenated-alkyd resins.

2. Black enamel systems should not be recoated between 2-24 hours.
3. White enamels containing Cycopol S102-5 should not be recoated between 1-8 hours.

The importance of the pigment volume to this lifting tendency factor is seen by a comparison of the white and black Cycopol Resin S100-1 enamels. While the white enamel was only slightly affected and the surface irregularities appeared as a pebbly effect rather than a clearly defined wrinkling, the black enamels actually wrinkled to varying degrees depending upon the time at which the film was recoated.

It was observed that baking does improve the solvent resistance of the styrenated alkyd systems. Inclusion of 15% or more melamine resin improves solvent resistance to a great degree.

Uses

Styrenated Oils — Floor enamels, baking enamels, wood primers, maintenance and architectural enamels, drum enamels, traffic paint, overprint varnishes and paper coatings and non-penetrating clear vehicles.

Styrenated Alkyds — Finishes for working machines, toys, venetian blinds, hospital fixtures, lacquer replacements, etc.

STYRENE IN EMULSION PAINTS

Mr. Parker first discussed the four methods used in carrying out the polymerization of styrene monomer, namely (1) mass, (2) suspension, (3) solution and (4) emulsion.

He differentiated between a homopolymer and a copolymer. For example, if the polystyrene chain contains only styrene units in its structure, the resultant resin is a true homopolymer. If prior to polymerization, the styrene monomer is mixed with butadiene a true copolymer of styrene-butadiene forms in which the resulting resin contains not only styrene units but also butadiene units along its length. In this instance, the copolymer has both units in any individual chain with no single chain containing either monomer alone.

In this connection, an important point brought out by Mr. Parker was that copolymerization should not be considered as limited to two monomers — the polymerization mixture may contain three or even more components, provided all have the required unsaturation.

The important part of Mr. Parker's talk dealt with emulsion polymers. An emulsion polymer consists of rather individual and discrete, spherical particles of extremely small size (0.2 microns in diameter). In the trade they are generally known as latices.

Polystyrene Latices

In the formulation of emulsion paints with styrene homopolymer and Lcopolymer type latices, three types of polymers are in general use:

Type I — Unplasticized styrene polymers (Lustrex 601-40, Monsanto Chemical Company)

Type II — Preplasticized styrene polymer (Lustrex 620, Monsanto Chemical Company and BKS 114, Bakelite Corporation

Type III — Styrene-butadiene copolymer (Latex 512 K and 762 K, Dow Chemical Company, Chemigum 101 AX, Goodyear Tire & Rubber Company)

Mr. Parker then went into detail regarding the formulation of water-emulsion paints employing the above latices; first discussing the various ingredients used and their purposes.

Formulation

Protective Colloid or Stabilizer — Colloidal materials to serving stabilize the dispersed particles against agglomeration forces and promoting continued retention of discrete particles form both in process and storage. Casein, alpha protein from soybean, certain soluble starches and chemical salts of high polymers are very effective as protective colloids.

Foam Suppressor — Prevents foam formation in the process of preparing the paint. Allow bubbles which form in the applied film to break quickly and diffuse satisfactorily without leaving craters. Water dispersible grade of glyceryl mono-ricinoleate and polyethlene glycol 400 monolaurate, Sterox CD (Monsanto Chemical Company) have been used for this purpose. They also help in wetting the pigment.

Thickeners — The purpose of these substances is to increase the viscosity to a point at which pigment suspension and good package stability, and good application consistency will result. They also help in controlling to some extent the levelling properties of the paint. Materials used are water-soluble cellulose compounds, alginate salts, and polyacrylate salts.

Plasticizer — The use of plasticizer applies to Type I and in certain cases to Types 2 and 3. The Type I latex is a post plasticized system (latex is plasticized after the polymer is formed to yield a film forming binder). The plasticizer should have the following properties for best results:

1. Compatible with styrene polymer to give a clear film.
2. Act as a solvent for styrene polymer in order that the coalescences of plasticized polymer particles will be complete in the final film. There should be a sufficient volume of plasticizer to insure ultimate film continuity and strength.
3. Fluid — If solid render it fluid by dissovling in appropriate solvent.
4. Capable of being emulsified.

Phthalate esters, phosphate esters, chlorinated aromatics hydrocarbons are examples of applicable materials.

Preservative — This material must be used when putrifiable material such as casein or protein substances are used as stabilizers. Santophen and Santobrite (Monsanto Chemical Company) Dowicide A & G (Dow Chemical Company) have proven effective.

Preparation of Paints

Type I Latex

1. Prepare protective colloid solution and emulsifier in the presence of the foam suppressor, add pigments and sufficient water to disperse the mixture. Good results are obtained when the ammonium salt of Lustrex 820 (Monsanto Chemical Company) is the protective colloid.
2. The selected plasticizer is emulsified with the above emulsifier-protective colloid solution or dispersion. For emulsification, no high speed mixers are necessary, ordinary mixing or grinding equipment will suffice.
3. Type I latex, any additional water, or other materials to complete the paint system are added to the plasticizer-emulsion combination (steps 1 and 2) and this is mixed thoroughly with ordinary mixing equipment.

Type II Latex

The protective colloid solution is prepared separately and the dispersion of the pigments is accomplished in the protective colloid solution. In case of Lustrex 820 (Monsanto Chemical Co.) protective colloid, the dispersion of the pigment may be accomplished during the formation of the colloid solution as in Type I latex process. In either case the pigment dispersion plus a foam suppressor is added to Type II latex, along with any other additive, and the whole mixture is subjected to a very thorough mixing to complete the paint. Since Type II contains the plasticizer, no more need be added.

Type III Latex

Same as Type II.

Mechanism of Drying

Plasticized styrene or styrene copolymers particles are suspended in the external phase, but are not soluble in it. When applied, the external phase evaporates and as it evaporates the remaining particles become de-emulsified (emulsion breaks) and as a result the particles coalesce forming a continuous film. Since the coalesced particles cannot be readily emulsified, the film quickly becomes highly water-resistant insofar as its ability to redissolve is concerned.

Mr. Parker stated that some 20 million gallons of latex paints were sold in 1951 and this is attributed to the following properties of latex paints: ease of application, rapid dry, freedom from fishing, odorless, good alkali and acid resistance, excellent sealing, washability, and stain resistant.

VINYL COPOLYMERS

Of particular interest was Mr. Calsibet's statement that the vinyl chloride type polymers account for approximately 80 per cent of the resin production commonly classified as vinyl. Of this main group of polymers, the vinyl chloride acetate copolymers were the first to achieve industrial significance and they make up the bulk of the resins used in vinyl coatings today.

Bakelite produced the first copolymer vinyl resin (polymers of vinyl chloride and vinyl acetate) in 1932. A desirable combination of the chemical resistance and inertness of polyvinyl chloride and the good solubility properties of polyvinyl acetate was sought. It was found that a copolymer consisting of 87% vinyl chloride and 13% vinyl acetate of medium molecular weight gave a desirable balance between chemical resistance, solubility, film strength and thermoplasticity. Later, this led to a series of copolymers in various molecular weight or viscosity grades.

Modifying Groups

About ten years ago, a further modification was made in the polymer chain, which involved the introduction of free carboxyl and hydroxyl groups.

It was noted that carboxyl groups in the chain, in small proportions, improved the adhesion of vinyls to metallic surfaces. In addition, the carboxyl groups permits reaction with other resins and basic pigments and impart certain thermosetting properites to the vinyl polymer.

It was found that small proportions of hydroxyl groups improve the compatibility of the vinyl copolymer with other types of resins, improve the adhesion to many surfaces such as cellulosics, raise the softening point and increase the tensile strength.

Mr. Calsibet then covered in detail such important factors as solubility characteristics, plasticization, pigmentation, air dry and baked vinyl coatings.

Solubility

Medium viscosity resins comprise about 20 to 23 per cent resin base solutions. Ketones comprise about ½ of the thinner component. For fast evaporating thinners used on paper, cloth or porous surfaces, MEK or acetone is the solvent. Spray finishes are formulated around MIBK while baking type finishes are modified with slower ketones such as cyclohexanone or ethyl butyl ketone. Aromatic hydrocarbons are used as diluents. Aliphatic hydrocarbons are to be avoided since they are powerful precipitants for vinyl resins. An important consideration in vinyl chloride resin solutions is the inclusion of about 0.2% of propylene oxide in the thinner as a precaution against traces of acid either in the resin or thinner. This prevents corrosion of the container often followed by a discoloration of the resin solution.

Plasticizer

These include phthalates, phosphates and linear polyester types. 10-20 per cent plasticizer based on the weight of resin is required for solution coatings. Tricresyl phosphate and di-2-ethyl hexyl phthalate are most widely used.

Important considerations in the selection of a plasticizer are compatibility, color retention, non-volatility, resistance to water, oil and to chemicals.

Pigmentation

Pigments of maximum hiding power are desired in order to prevent too great a change in the film properties due to the bulk of pigment in the film. Fillers and extenders are rarely used. Pigments containing iron and zinc are to be avoided since they catalyze the thermal degradation of the resin and are avoided in finishes baked above 300°F. Most vinyl resins with the exception of types containing carboxyl groups are non-reactive toward pigments and as a result do not readily wet pigments. For best results the pigment is dispersed in a fluxed mass of resin and plasticizer on a 2-roll rubber mill. The pigment chips are converted to a paste by soaking in a small amount of solvent and then stirring to a smooth consistency. With viscous solutions, internal mixers are effective in dispersing the pigments. Ball and pebble mills are used with a limited number of pigments for glossy finishes.

Baked Coatings

For adhesion to smooth surfaces straight vinyl copolymers require a baking temperature of 350°-375°F. Long bake at low temperatures does not develop adhesion, according to Mr. Calsibet. In multiple coat application, it is only necessary to bake the primer at 350°F. to obtain adhesion. Subsequent coats require baking only to speed the removal of solvents.

Since degradation of the resin occurs at specified baking temperatures, it is necessary to add stabilizers which are capable of reacting with the liberated hydrogen chloride. Lead pigments and epoxide compounds are satisfactory for this purpose.

Air-Dry Coatings

For developing adhesion over smooth surfaces, reactive-type resins must be used in the formulation of air-dry systems. For such surfaces as metal, glass, or ceramics, the free carboxyl type is recommended. Usually 50 per cent or more of this type with one of the non-reactive resin works satisfactorily. For such surfaces as old paints, thermosetting plastics, cellulosics, the free hydroxyl type is recommended. VMCH is the free carboxy type and VAGH is designated as the free hydroxy type resin.

With resin VMCH basic materials are to be avoided since they react with the carboxyl groups and destroy their ability to adhere. Basic pigments will cause livering. Solutions of this particular resin must be neutral. If acid, corrosion of containers will occur; this may be avoided by incorporating propylene oxide in thinner formulation.

VAGH is a vinyl chloride acetate-alcohol resin, the hydroxyl groups present reactive positions through which the resin can be chemically modified or insolubilized. Of particular interest with this type of resin is the development of air-dry corrosion resistant finishes which are applied over a vinyl butyral wash primer. Here VAGH resin is required to obtain adhesion.

Dispersion Coatings

There are two types of dispersion coatings, plastisols and organosols.

A plastisol is a dispersion of submicroscopic particles of high molecular weight vinyl chloride or vinyl chloride-acetate resin in a plasticizer. When heated the plasticizer dissolves or fuses the resin particles into a homogeneous elastomeric state.

Vinyl dispersion resin compounds containing volatile organic liquids are called organosols. The volatile content ranges from 5-50% by weight of the finished organosol and usually consists of low-priced liquids.

Preparation of organosol is carried out by adding all ingredients — resin, plasticizer, stabilizer, pigment, filler and volatile liquids in a pebble mill grinding for 18-24 hours. Water cooled mills are used to permit accurate control of temperature.

The quality of grind, age stability and viscosity characteristics of the finished organosol is dependent on the ratio of various types of liquids present. Considering plasticizers, ketones, esters as dispersants, and classifying aromatic, naphthenic and aliphatic hydrocarbons as diluents, proper balance between these two are important. Too much diluent results in flocculation and too much dispersant results in excessive swelling of the resin particles.

Plastisols are prepared on a three roll mill; or in some cases in a pony mixer.

P&P NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY

HELLIGE

COLORIMETER
For Grading and Control

Colorimeter and turbidmeter is designed for chemical analysis, product grading and process control in paint and varnish manufacture. Uses include detection of contamination, control of polymerization, and color grading of solvents.

This unit features selective color filters covering the entire visible spectrum, square and round absorption tubes, sealed photocell, meter, and automatically focused bulb. Three-step operation gives quick readings. Operates on all standard voltages and frequencies, as well as from two small dry cell batteries for complete portability. Hellige Inc., 877 Stewart Ave., Garden City, N. Y.

POWDER CAMERAS
For X-Ray Diffraction

Available in two sizes, 114.59 mm. and 57.3 mm. diameters, these new cameras will record up to 17 Angstrom spacings with copper radiation, with low air scatter and unusually clear patterns in the forward reflection region.

Briefly, the new Philips powder cameras incorporate these features: higher intensities, requiring shorter exposure time; better relative intensities; lower background; clean low angle forward reflection region; high degree of alignment and realignment precision; high resolution; cameras adaptable to tracks of other existing standard types of x-ray diffraction apparatus; large camera will record spacings up to 17 Angstroms with copper radiation and up to 26 Angroms with chromium radiation. Research & Control Instruments Div., North American Philips Co., Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.

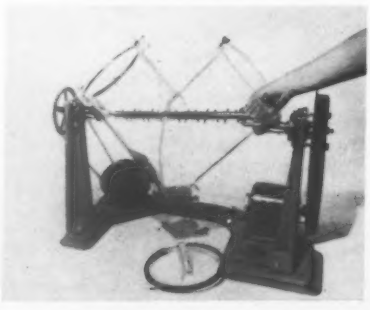
TWIN-SHELL BLENDER
With Intensifier Bar

Twin-Shell blenders is equipped with a rotating "Intensifier Bar". The lug-studded intensifier bar improves mixing action by effectively breaking up lumps, dispersing materials which tend to agglomerate, and homogenizing liquids into solid mixes.

The blenders are used for mixing paint pigments, insecticides, metal powders, plastic powders, ceramic glazes, detergents, dyes, minerals, resins and many other compounds.

Descriptive literature on the intensifier bar and on the twin-shell blenders may be obtained from the Patterson-Kelley Company, 516 Warren St., East Stroudsburg, Pa.

PATTERSON-KELLEY



MURPHY & MILLER

HUMIDITY CABINET
Eliminates Condensation

A Humidity testing cabinet with a 27 cu. ft. working area will supply relative humidity between 20% and 95% in the temperature range +35°F to +185°F.

Among the advantages claimed for the new unit by the manufacturer are faster temperature regulation throughout the range, and the elimination of troublesome and damaging condensation caused by changing temperatures during the course of a test.

Optional equipment includes a time schedule control system which will pre-set dry and wet bulb temperatures and thereby vary the relative humidity progressively to any desired sequence. Murphy & Miller, 1326 S. Michigan Ave., Chicago, Ill.

ALUMINUM TINTING PASTE
Formulating Polychromes

Aluminum Tinting Paste No. 222 is said to impart greater two-tone, flash, and glamor for poly chrome or metallic finishes. Gives brighter finishes. Metal content is 65%, weight per solid gallon is 12.245 lbs., and it has a bulking value of 0.0820 gal. per pound. Aluminum Co. of America, Pittsburgh 19, Pa.

NEW PRODUCTS

BROOKFIELD

VISCOMETER
Portable Type

Eight-speed Brookfield viscometer is designated Model LVT. With its 200 to 1 ratio of speeds starting at .3rpm, this model is useful where wide ranges of viscosity may be encountered.

When equipped with UL adapter, this viscometer can measure any viscosity between .5cps and 2,000,000 cps with accuracy, according to the manufacturer.

In addition to the new eight-speed illustrated and described above, and a new modified four speed model, this line includes some 10 other single and four-speed models in various rpm's up to 600. May be secured with explosion-proof construction.

Determinations are secured directly in centipoises by merely inserting the instruments spindle in the material to be measured, flicking on a switch, and reading dial. Brookfield Engineering Laboratories, Inc., Porter St., Stoughton, Mass.

PYROMETER
For Surface Measurement

"Pyro" surface pyrometer is available with a selection of 14 different types of thermocouples and extension arms to meet every surface and sub-surface temperature measuring problem, according to the manufacturer. Temperature readings can be taken readily from the large 4-3/4 inch direct-reading dial. Available in five different temperature ranges for all laboratory and plant use. Pyrometer Instrument Co., Bergenfield, N. J.

PAINT STRAINER
Rugged Construction

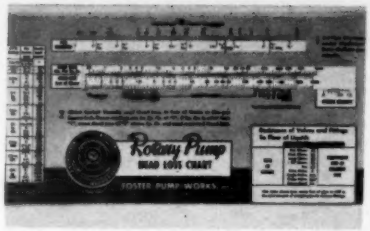
Rein-Strainer has an aluminum-coated steel wire stand that supports an aluminum funnel in which copper-mesh strainer is held in place by a steel wire loop. According to the manufacturer, this strainer is durable and rust resistant and practical for the laboratory. Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Md.

GARDNER

TRIPLE BEAN BALANCE
Has Undivided Tare

Undivided tare will render this balance useful in the laboratory and industrial applications where it is desirable to obtain net value of the product being weighed without further calculations. The empty container is balanced by use of the tare poise which can be locked on the undivided tare rod for repetitive weighings. The value read on the balance after filling the container thus represents only the material in the container.

The balance is equipped with stainless steel plate and etched stainless steel beams. It features a full load capacity of 2610 grams with a sensitivity of 1/10 gram. In addition to the standard metric balance it can also be supplied in the avoirdupois or troy standards. Ohaus Scale Corp., 1050 Commerce Ave., Union, N. J.



FOSTER

COMPUTER
For Pipe Friction Loss

Slide rule computes the friction of varying capacities in different sizes of pipe with the viscosity of the liquid being known. With this slide rule, accurate pipe friction losses can be determined for all liquids, from those with the viscosity of water up to those with an equivalent viscosity of 500,000 S.S.U. Especially useful in determining the size of pumps and the horse-power required to drive the pumps, in chemical plants, in paint, varnish and lacquer works, and in other industries where the handling of viscous liquids or semi-solids is a production necessity. Available from the Foster Pump Works, Inc., 50 Washington Street, Brooklyn 1, New York.

SYNTHETIC WAX BEADS
Ease in Handling

The high melting point (143° C.) synthetic wax, Acrawax C is now available in bead form. This form offers definite advantages in handling and use. The beads are of relatively uniform small particle size which flow readily when poured from the drum. "Fines" have been reduced to a minimum.

Acrawax C is also supplied in the following forms, solid, powdered, atomized, and (aqueous) dispersion S-933. This product is used as a lubricant, release agent, anti-tack agent, electrical insulant, for moistureproofing and as an additive for waxes, asphalt and resins to raise their melting points. The industries in which it is used are metals, adhesives, plastics, rubber, paints, electrical, textile and asphalt.

Samples and complete data are available from the manufacturer, Glyco Products Co., Inc., 26 Court Street, Brooklyn 2, New York.

NEW PRODUCTS

MANUFACTURERS

DIFFERENTIAL COLORIMETER
Infrequent Standardization

Useful in obtaining color measurements of paints, liquid solutions, pigments, etc. Simple to operate and provides quick readings.

Three color filters give approximations to the I.C.I. X, Y, and Z functions, and transmissions and reflections are measured directly. The linearity of the instrument is within approximately 0.2 per cent reflectance or transmission down to 10 per cent; by standardizing on a known dark panel, the range can be extended far below 10 per cent, with linearity within approximately 0.02 per cent. The dial can be read to 0.1 per cent, and hundredths of a per cent can be readily estimated. The dead zone (back-lash) does not exceed 0.02 per cent reflectance or transmission.

Because colorimeter is highly stable after a warm-up of ½ hour, it requires infrequent standardization, according to the manufacturer. Operates from 60 cycle 115 volt power mains. Manufacturers Engineering & Equipment Corp., Hatboro, Pa.

ELECTRIC HEATERS
Improved Types

Design of Chromalox type TBL electric tank heater now includes a vapor-tight terminal box as a standard feature. Heavy duty Chromalox tubular elements are welded to the sealed, electrical connection housing and the wiring is brought out to the terminal box through a thick-walled steel pipe. The new construction is intended to give longer, safer usage of the units in the presence of corrosive and penetrating vapors.

Chromalox TBL units are available in steel, alloy, or stainless with ratings from 3 to 7.5 Kw. Heated height ranges from 11⅛" to 43¾" and length of feet from 13-7/16" to 25-9/16".

The type ARMT screw-plug unit with explosion-proof or vapor-tight terminal box is now available with wider built-in thermostatic range.

The safety features of this unit minimize the danger of heating near explosive fumes from gasoline, natural gas, acetone, lacquers, etc. This type of heater is used for process heating in oil refining, paint, chemical, and plastics manufacturing. The built-in thermostat simplifies installation and wiring. E. L. Wiegand, 7632 Thomas Blvd., Pittsburgh 8, Pa.

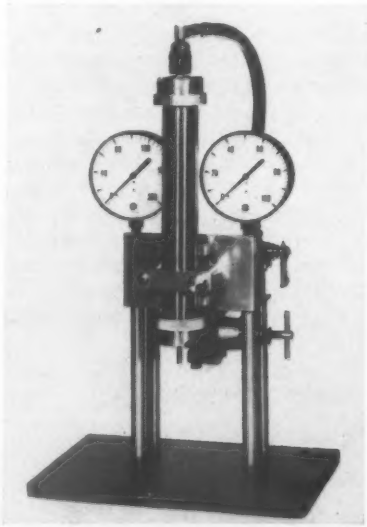
VISCOSITY CUP
Pressurized Type

Pressurized viscosity cup permits greater accuracy and latitude in viscosity studies as a result of research on Vinylite dispersions, according to the manufacturer.

It is fast, accurate, simple to operate, and is especially suited for plastisols, organosols, mill pastes, inks, greases and dispersions.

Measures of viscosities are in terms of pressure, quantity, time and orifice size. Various orifice sizes are available, and operating pressures range from 0 to 100 psi.

CASTOR

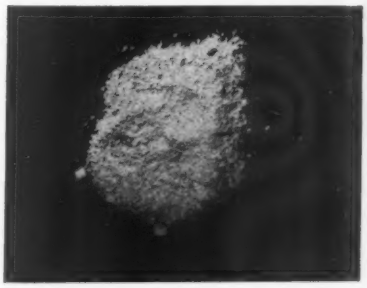


For further information, contact Castor Laboratory Equipment Company, 741 Shady Lane, Mount Lebanon, Pittsburgh 34, Pennsylvania.

WOLLASTONITE
Pigment Extender

Calcium metasilicate, known as wollastonite, is a white mineral which according to the manufacturer has remarkable physical and chemical uniformity. It is fibrous in nature and recommended as paint extender pigment. Wollastonite as a paper coating pigment is being investigated. Has possible use as a filler in asphalt tile and plastic.

Four commercial grades are being produced, a P-1 grade for paint trade, C-1 for the ceramic industry, and two fiber grinds, F-1 and F-2. Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass.



CABOT

PAINT CHIPS & RESIN
Varied Uses

Designated "9200" Paint Chips, these chips are especially ideal for the smaller paint manufacturer, and easily prepared for a wide variety of finishes. Colors and pigments are already dispersed in the resin ready for direct mixing into solvents.

"9200" Paint Resin has been designed for large manufacturers and are compatible with other types of resins, plasticizers and extenders. Finishes formulated with this resin are said to have good resistance to acids and alkalies. This resin also offers more flexibility in compounding any desired finish with controlled drying time. It is said that paints prepared from "9200" Resin have can and dip-tank stability.

Both chips and resin are recommended for manufacture of traffic, stucco, concrete, aluminum finishes and acid-resistant enamels, and wall sealers. Marbon Corp., Gary, Indiana.

Now...protect your

outside whites against cracking

this lower-cost way

Dutch Boy* **Basic Silicate White Lead "45X"**

"lead" at its efficient, economical best

It's lead soaps that do it...

Lead soaps give a paint film the distensibility and flexibility needed to prevent cracking and scaling under the stresses set up by varying thermal and humidity conditions.

And to form these soaps, you now have a pigment that's more economical and efficient than any other type of "lead": "Dutch Boy" Basic Silicate White Lead "45 X".

This latest development in white lead concentrates the reactive portion of each pigment particle at the surface. Thus, it makes available proportionately larger amounts of "lead".

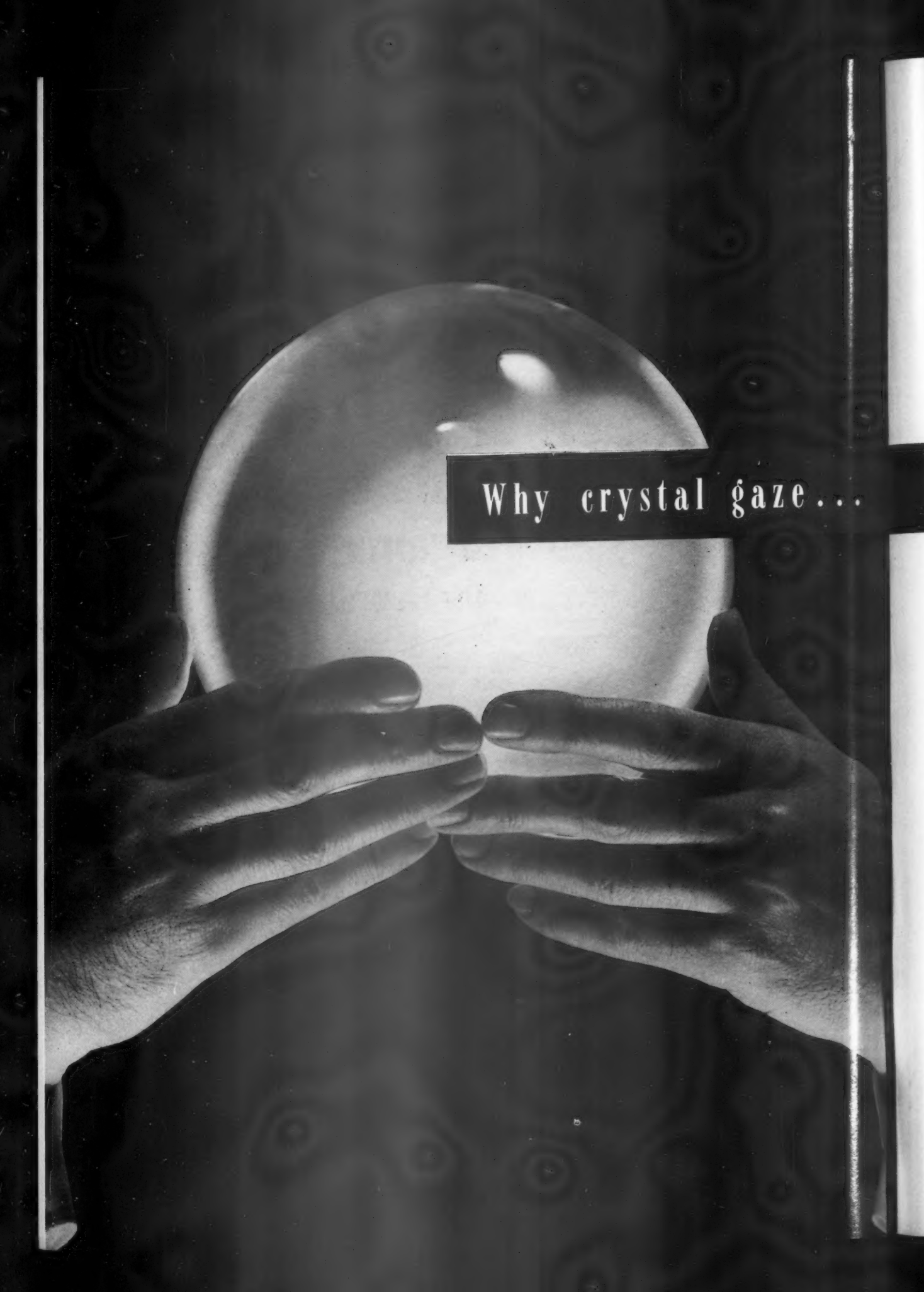
You use fewer pounds, too

That's because 60 to 63 weight units of "Dutch Boy" Basic Silicate White Lead "45 X" equal in volume 100 weight units of standard white lead types.

Many leading paint manufacturers are reducing costs, without sacrificing quality, by using "Dutch Boy" Basic Silicate White Lead "45 X" in their outside white formulations. Try it yourself.

ATIONAL LEAD COMPANY: New York 6; Atlanta; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.).

*Reg. U. S. Pat. Off.


Why crystal gaze...

. . when you can be sure?

call a specialist in TALL OIL products

Arizona Chemical specializes in tall oil fractionation at its modern plant in Panama City, Florida . . . a center of raw material supply.

That's our story in a nutshell.

Because we specialize in fractionation, our Acintol* Tall Oil products give you advantages you can't get elsewhere. And pleasantly enough . . . satisfied customers seem to agree with us.

Acintol Tall Oil products are:

VERSATILE . . . available in a range of grades for use in paint driers . . . in esters for paints and varnishes . . . in modified alkyd resins . . . in linoleum and linoleum binders . . . or anywhere you need a reliable source of rosins or fatty acids of semi-drying oils.

ECONOMICAL . . . since the raw material comes from a domestic supply and is free from the many rapidly changing factors affecting other fatty acids and rosins, Acintol Tall Oil products are not subject to wide price fluctuations.

AVAILABLE . . . no worries about shortage here. You can get swift deliveries in the quantity you desire.

OF HIGHEST QUALITY . . . only Arizona's specialization can bring you products with specifications like those below:

the highest quality tall oil rosin available commercially**

ACINTOL R
tall oil rosin

Typical Specifications

Acid number	160-170
Saponification number	168-178
Fatty Acid content	0-3%
Softening point	158-190°F
Color	N-WW

the outstanding tall oil fatty acid with low unsaps and low rosin

ACINTOL FA #2
tall oil fatty acid

Typical Specifications

Acid number	192-195
Linoleic acid	46%
Rosin acids	1.5% max
Unsaponifiables	2.7% max
Color (Gardner)	6-8

the distilled tall oil with low unsaps

ACINTOL D
distilled tall oil

Typical Specifications

Acid number	188-193
Rosin acids	30-34%
Fatty acid total	63-67%
Unsaponifiables	1.5-2.5%
Color (Gardner)	8-11

**Trade-mark*

***Tall Oil Rosin as defined by The Naval Stores Act, Sec. 160.305.*

Producers of:

ACINTOL C Crude Tall Oil
ACINTOL D & DLR Distilled Tall Oil
ACINTOL P Tall Oil Pitch
ACINTOL R Tall Oil Rosin
ACINTOL FA #1 & FA #2 Tall Oil Fatty Acids

See for yourself what Acintol Products can do. Send today for samples and quotations.

ARIZONA CHEMICAL COMPANY

30 Rockefeller Plaza, New York 20, N. Y.

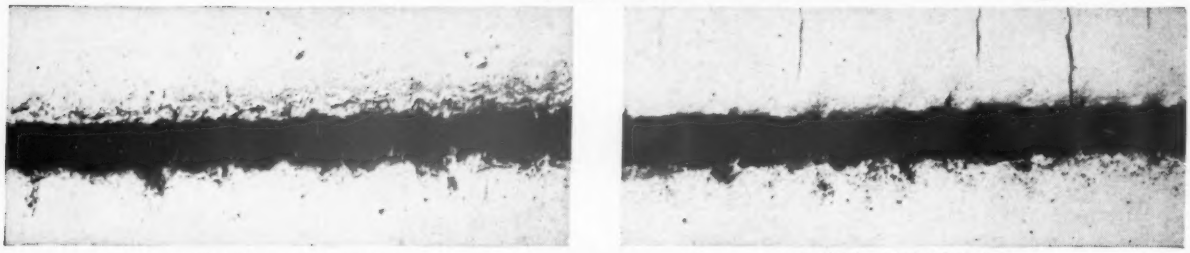
WHITE LEAD PRIME COATS improve paint systems

Weathering tests on saw-cut panels prove that white-lead-base primers, used in two coat house paint systems, improve adhesive and water resistant qualities and lengthen protective and decorative life.

The test panels show how, after one year's exposure to Long Island's erratic weather conditions, the system with the white-lead-base primer has maintained its film integrity and adhesion and that the finish coat formulation is not as suitable as a primer.

No stronger or more convincing argument can be given for using white lead pigment in your primer formulations; and certainly, no customer could ask for better proof of the protection of white lead primers in his house paint systems. For information on the most effective use of "lead" in your paints, write for "White Lead in Mixed Pigment House Paints," and "White Lead Technical Bulletin #1." *Lead Industries Association, 420 Lexington Avenue, New York 17, New York.*

In this comparative weathering test, a commercial, lead-base, finish paint, was applied, self-primed, to a cedar panel (right). The panel on the left has a topcoat of the same finish paint but it has been applied over a typical, white lead-base, multiple pigment primer. On both panels the edges were thoroughly sealed with two coats of L.I.A. primer P-4. Cross grain saw cuts were subsequently made two inches into the panels from one edge. The panels were then exposed 45 deg. south vertical at Sayville, Long Island, New York.



Finish Paint on Primer Base (MAGNIFICATION 4X) Self Primed Finish Paint

The photographs show the film cracking effect moisture has on the self primed house paint system as compared to the protection given by white lead base paint, formulated as a primer.

"LEAD" LENGTHENS THE LIFE OF PAINT BECAUSE:

It Stabilizes . . . neutralizes acidic compounds resulting from decomposition of the vehicle – prevents the film from becoming soft or liquefying.

It Plasticizes . . . forms lead soaps which increase film flexibility.

It Strengthens . . . mechanically reinforces the film, increasing its elastic strength with flexible, spiny lead-soap particles.

It Resists Water . . . reduces water sorption to a small fraction of that of lead-free paints.

It Limits Oil Penetration . . . holds more of the vehicle in the film where it is needed; less in the substrate.

It Prevents Chalking and Inhibits Mildew . . . makes paint look better, longer.

L.I.A. PRIMER P-4*

Pigmentation (64.1%)	Per Cent	lb./100 gal.
White Lead	48.5	473
Rutile Non-Chalking Titanium Dioxide	15.1	148
Magnesium Silicate	35.4	345
Litharge	1.0	10
Total	100.0	
Vehicle (35.9%)	**Per Cent**	
Raw Linseed Oil	34.0	187
VM1767**	21.0	113
VM1693***	10.5	58
Blown Linseed Oil (Z-2)	5.0	27
Driers	0.5	3
Mineral Spirits	29.0	160
Total	100.0	1524

PVC=39.4%

FINISH PAINT

Pigmentation (63.1%)	Per Cent	lb./100 gal.
White Lead	35.0	336
Zinc Oxide	30.0	290
Anatase Titanium Dioxide	15.0	145
Magnesium Silicate	20.0	191
Total	100.0	
Vehicle (36.9%)	**Per Cent**	
Refined Linseed Oil	60.0	336
Bodied Linseed Oil (Z-2)	15.0	84
Mineral Spirits	22.0	124
Driers	3.0	16
Total	100.0	1522

PVC=33%

* formula from "White Lead Technical Bulletin #1."

** 60 parts linseed oil; 40 parts dehydrated castor oil, bodied to obtain a viscosity of V. Gardner 70% solids in mineral spirits.

*** 5 gal. length, low acid number ester gum varnish cooked with dehydrated castor oil. Viscosity is B-C Gardner at 59% solids.

1678

Walter W. Cranmer

N. Y. Club Holds Lively May Meeting

Some 250 members and guests attended the regular May Meeting of the New York Paint and Varnish Production Club on May 1st. The evening program included the election of officers for the coming year, a talk by Walter W. Cranmer of the Philadelphia Naval Shipyard on "The Navy Looks at Maintenance Painting", a report on the Mattiello Memorial and PaVaC awards.

William Greco, Federation Council representative from the New York Club reported on the spring meeting of the council held at Baltimore on April 19th.

Dr. Raymond B. Kirk of the Brooklyn Polytechnic Institute, chairman of the Mattiello Memorial committee stated that the collection of paint industry literature is growing steadily and that he hoped that in the near future a separate room or alcove could be assigned for this purpose at the college.

The chairman of the nominating committee, William J. Greco, proposed the following men for club officers for the coming year: E. Dale Albert, M. J. Merkin Paint Co. for president; W. W. Santoro, Standard-Toch Chemicals, Inc. for vice-president; John S. Congleton, Maas & Waldstein Co. for secretary; Irving Flaumenhaft, Lacquer & Chemical Corp. for treasurer. E. Paterno, Technical Color and Chemical Works, Inc.; Francis J. Rogers, Adco Chemical Co., and F. M. Damitz, National Varnished Products Corp. were slated for the executive committee.

The PaVaC Award is an honor bestowed by the Club on members for outstanding contributions to the advancement of the Protective Coatings Industry and the New York Paint and Varnish Production Club. President Herbert E. Hillman bestowed the honor to the eight members receiving the Award this year.

E. Dale Albert, Chairman of the Program Committee announced that all arrangements have been completed for the Club's June 7, 1952 outing to be held at the Jumping Brook Country Club in Neptune, New Jersey. Dale then introduced the speaker of the evening Walter W. Cranmer.

Mr. Cranmer is a group leader at the Philadelphia Naval Shipyard in charge of research on protective coatings at the Industrial Test Laboratory. He holds a B.S. degree from Temple University and has published many papers on protective coating subjects, his latest being a paper on "Gasoline Resistant Tank Linings".

In "The Navy Looks at Maintenance Painting" Walter Cranmer pointed out that the real proof of a coatings performance can be had only by extensive practical application. He feels that there may be something to the claim that much money is wasted on testing procedures as well as on formulations primarily because laboratory conditions of tests do not reflect true field conditions. As a result the stress today in Navy test work is to improve application methods and to train Navy personnel in the proper preparation procedures. Paints developed and tested to give excellent results under laboratory standards have too often failed under fleet service conditions. However, in most cases the failure has been traced back to poor surface preparation. Heretofore, it has not been considered too important to remove all the rust which formed in steel. Tests prove that the life of a coating can be extended immeasurably if the time and trouble is taken to prepare the surface properly in the first place.

Because of the difficulty in always getting a rust free surface, Mr. Cranmer described a series of tests made over rust. Rusted panels were finished with many types of coating and exposed to a marine atmosphere. By means of slides these exposures were shown before and after; exposure time was short according to usual standards being in the order of two to four months to failure.

Other slides shown were of sections of naval vessels before painting, after the surface had been prepared, after painting and finally the exposed job. A regular part of the Navy program today is the photographing and recording of these test sections on equipment and ships. As a consequence, the personnel of the fleet are doing a much better painting job and are proud of the test work they are doing.

After an extended question and answer period a color movie was shown that is used to train Navy men in the fundamentals of good surface preparation and proper painting procedure.

R. W. Quarles Addresses New England Club

The New England Paint & Varnish Production Club met for a regular April meeting at the Hotel Puritan with 65 members and guests present.

Speaker for the evening was Dr. Richard W. Quarles of Carbide and Carbon Chemicals Co. The main theme of his talk was the precautions necessary to obtain good performance from wash primers. "Clean surfaces are the most important single factor in insuring the adhesion and life of a vinyl coating," stated Dr. Quarles. Profusely illustrating his talk with panels, Dr. Quarles went on to show the failures that result from improperly prepared surfaces.

•

C. L. Warwick, Executive Secretary of ASTM Dies

C. Laurence Warwick, executive secretary, American Society for Testing Materials, and its administrative head since 1919, died recently shortly after presiding at a dinner honoring the retiring Treasurer of the Society.

Mr. Warwick had been active in the Society since 1909 when he graduated from the University of Pennsylvania in civil engineering. While he was instructor and assistant professor at the University, he also served as assistant secretary of ASTM with Edgar Marburg, the Society's founder secretary. In 1919, on the death of Dr. Marburg, he was appointed secretary-treasurer (chief executive officer) and in 1946 became executive secretary.

He had made many notable contributions to the field of standardization and research in materials and was recognized as an outstanding authority on materials. One of his important contributions was in the War Production Board during World War II, where he served as Head of the Specifications Branch of the Conservation Division, and later headed the Materials Division. This work resulted in tremendous savings of critical and strategic war materials through the issuance of emergency standards and in other ways.

•

New Still Doubles Nuodex Production of Naphthenic

The new stainless steel vacuum still, placed in operation recently in the Elizabeth plant of Nuodex Products Co., Inc., drier manufacturers, will more than double the company's production rate of distilled naphthenic and other organic acids.

The new still improves the purity and uniformity of acids refined by removing contamination and minimizing color and odor. Also, in times of tight supply of some raw acids it permits the use of more available acids, yet produces a refined product of excellent quality.

UCC Executive Appointments

Morse G. Dial has been elected president of Union Carbide and Carbon Corp. and Kenneth H. Hannan has been elected treasurer according to a recent announcement by Fred H. Haggerson, chairman of the board.

•

RCI Opens New Technical Service Lab in Midwest

A new technical service laboratory and offices for management, sales and office personnel have been opened by Reichhold Chemicals, Inc., at the company's Midwest Division (Argo) plant located at 7738 West 61st Place, Summit, Ill. Total floor space spread over two stories approximates 9,000 square feet.

John M. Hafeli, General Manager, says of the expanded facilities, "RCI-Argo is better equipped at present than ever before to serve its customers, due to the fact that management and sales offices and technical service laboratories are now located under one roof."

The technical service laboratory, under the direction of James L. Pool, occupies the second floor. Mr. Pool has had wide experience in the paint, varnish and related fields, and his background includes both sales and technical service work.

RCI's new offices and laboratory may be reached by telephoning either Reliance 5-4400 or Summit 2400.

•

Du Pont To Mark 150th Anniversary on July 18

The 150th anniversary of the establishment of E. I. du Pont de Nemours & Company will be marked July 18 at the site of the first Du Pont powder mills on the banks of Brandywine Creek a few miles from Wilmington, Del. The ceremonies, which will include a simple historical dramatic prologue, addresses by company officials, and the dedication of a marker on the site of the first plant, are the focal point of observances by the Du Pont Company.

About 6,000 spectators — representatives from the 71 plants and Wilmington offices, retired employees, members of the du Pont family, and guests — will be on hand for the program. Thousands of men and women at Du Pont plants, laboratories and sales offices, as well as their families and friends, across the country can hear the program which will be broadcast over a national network.

Emery Meeting. Seated (l. to r.): H. Armitage, W. Siemens, J. Clancy, W. Meinert, R. Hull, A. McDermott, L. Hadobas, R. Behrmann, V. Colby. 2nd Row: R. Brown, K. Boyd, J. Washburn, J. Kramer, R. Roberts, D. Eagleson, F. Ekstrand, N. Reinert, N. York, R. Geis. 3rd Row O. B'Hymer, N. Ruston, W. Colby, J. Funk, T. Reilling, L. Church, L. Francis, J. Ritz, A. Fusaro

Emery Holds Sales Meeting

Among the most important announcements released at the annual meeting of the Chemical Sales Staff of Emery Industries, Inc., held at Cincinnati recently, was the program of territorial expansion now underway to insure better service to users of Emery fatty acids, Twitchell products, and plasticizers.

Mr. A. R. McDermott who comes from the Chicago district office, will assume the responsibility for all sales in Texas, Louisiana, Oklahoma and Arkansas. Mr. N. F. Reinert, formerly with the Development and Service Department, is assigned to the Chicago office where he will work under Mr. D. R. Eagleson who is in charge of that office.

A new addition to Emery's sales staff, Mr. F. L. Ekstrand will be assigned to the Philadelphia office and will cover eastern Pennsylvania and southern New Jersey, as well as parts of Philadelphia.

The general theme of the sales meeting was "Better Service to Fatty Acid Users". This was highlighted by an unusual panel discussion in which the individual salesmen exchanged information, ideas, and experiences pertaining to both successful and unsuccessful sales experiences and product applications. Unusual applications of Emery fatty acids, plasticizers, textile oils, and emulsifiers, were both enlightening and entertaining. Each discussion was supplemented with samples of the products involved.

Several new products were released from the Development and Service Department to become important new sales products. Full details concerning these will be released soon.

Eight Members of N.Y. Club Receive PaVaC Award

The New York Paint and Varnish Production Club honored eight of its members at the May 1st meeting by presenting them with a Pa VaC Award. The Award is made for outstanding contributions to the Paint and Varnish Industry, and to the welfare of the Club. The contributions of those receiving the award include the preparation of scientific papers, development of new test methods for the industry, administration ability in the affairs of the New York Club and also in the Federation of Paint and Varnish Production Clubs.

The names and affiliations of those honored at the May 1st meeting are:

A. O. Allen — Vita Var Corporation, Newark, N. J., R. D. Bonney — Congoleum-Nairn, Inc., Kearny, N. J., E. J. Cole — Manufacturers Varnish Co., Brooklyn, N.Y., F. M. Damitz — National Varnished Products Corp., Woodbridge, N.J., R. H. Everett — M.J. Merkin Paint Co., Inc., N.Y. City 18, N.Y., W. J. Greco — Socony Paint Products Company, Metuchen, N.J., H. F. Payne — American Cyanamid Company, N.Y., 20, N.Y., F. G. Schleicher — W. D. Wilson Printing Ink Co., L.I. City, N.Y.

Previous recipients of the Pa VaC Award include such outstanding men as K. J. Howe, J. J. Mattiello and R. J. Moore who made international reputations in the Paint Industry.

•

Baltimore Production Club Elects New Officers

The final meeting for 1951-1952 year was held on Friday, May 9, 1952 at the Park Plaza Hotel, Baltimore, Md. The club elected unanimously the following officers for the September 1952 to September 1953 year:

Thomas R. Reece, president; Leonard H. Cohan, president-elect; William G. Wright, secretary and O. J. Hinz, treasurer.

Save time!

Save handling costs!

Use Barrett's

EXPRESS tank-truck delivery of

Aromatic Solvents

Direct to your storage tanks!
In 11 key industrial centers!

BENZOL · TOLUOL · XYLOL · Hi-Flash Solvent

All it takes is a phone call—and these vital industrial solvents will be delivered promptly to your storage tanks by speedy tank-truck delivery. For *regular* delivery, as well as emergency supplies, it will pay you to use this Barrett service.

1. Assure flexible supplies to meet fluctuating demands.
2. Save time and handling charges.
3. Know that the aromatic solvents you use will be of uniform high quality.

Barrett is Basic

Phone the Barrett office nearest you for express tank-truck delivery of aromatic solvents within 60 miles of these cities:

New York	*Whitehall 4-0800*
Detroit	*Vinewood 2-2500*
Philadelphia	*Jefferson 3-3000*
Chicago	*Bishop 7-4300*
Boston	*Malden 2-7460*
Cleveland	*Cherry 1-5943*
†Los Angeles	*Mutual 7948*
St. Louis	*Lockhart 6510*
Indianapolis	*Garfield 2076*
Newark	*Mitchell 2-0960*
†Buffalo	*Regent 3750*

Barrett*

*Reg. U. S. Pat. Off.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

†Hi-Flash Solvent not available at this station

NEWS DIGEST

K. S. B. Wade

K. Wade Joins Technical Staff of Binney & Smith

K. S. B. Wade has joined Binney & Smith Co. as a member of its technical staff according to an announcement made by J. W. Snyder, technical director of the company.

Mr. Wade received his chemical engineering degree from Northeastern University. Subsequently he spent several years with C. K. Williams & Co. in research and technical work, specializing in applications of iron oxides and chromium oxides in the paint, paper and granules fields.

He has also been connected with Diamond Alkali Co. in sales promotion work for chlorinated paraffins as applied to paints and plastics, and with Titanium Pigment Corporation as a member of their technical staff chiefly concerned with the application of Titanium pigments to all types of paints.

•

Eagle-Picher Appoints Eastern Paint Head

M. W. Venable, general sales manager of the Paint and Varnish Division of The Eagle-Picher Company, announces the appointment of Mr. Ralph R. Riker as eastern sales manager of that division.

Well known in the paint industry, Riker has both a sales and a technical background that makes him exceptionally well qualified for his new post. Previously, Riker had served as Sales service manager with Eagle-Picher. Riker will make his headquarters in New York City.

Harding of Boydell Paint Receives Wayne U. Award

Among the five men named receiving alumni awards for distinguished professional and civic service at the annual alumni reunion of Wayne University, Detroit, May 3 is Leonard J. Harding, general manager of Boydell Paint & Varnish Company.

Harding, a 1926 business administration graduate of Wayne, is a past president of the alumni association. He served with the Michigan National Guard for 17 years before entering the U. S. Army in 1941 with the rank of major. In 1943 he joined the Michigan State Troops, retiring in 1946 with the rank of colonel commanding Detroit's own 31st Infantry Regiment.

For the past four years he has been appointed by the Mayor to the Detroit Clean-Up, Paint-Up, Fix-Up Committee and last year was vice-chairman of the national Committee.

Harding's professional activities include membership in the Detroit Paint, Varnish, Lacquer Association where he has served as secretary, treasurer, president and member of the executive committee.

Industrial Finishing Exhibit Slated for June 16-19 in Chicago

The Industrial Finishing Exposition of 1952 will be held at the International Amphitheatre, Chicago, June 16-19.

Carrying an "All-Industry" theme, the show has been enlarged to include manufacturers of paint, lacquer, enamels, spray painting equipment, ovens, and all related fields. Material shortages and technological advances in both organic and inorganic finishing fields have brought about the consolidation in the 1952 show.

In conjunction with the exposition, the AES will hold its 39th Annual Convention at the Conrad Hilton Hotel.

•

S. T. Ellis Named V.P. Of Commercial Solvents

Sydney T. Ellis has been named a vice president of Commercial Solvents Corporation, it was announced by J. Albert Woods, president. His principal responsibility will be in connection with the company's expansion and development program. During the past year Mr. Ellis served as Assistant to the President, in which capacity he will continue.

Canco Unveils "Jet" Styling For Pressure Type Containers

A wide range of new valve-type metal containers for various products dispensed by pressure methods from the container was featured by American Can Company in its exhibit at the 21st National Packaging Exposition of the American Management Association in Atlantic City.

The display highlighted Canco's customized "jet-container" line for service to customer industries, and included a score of containers in sizes ranging from 2" to 4½" high which can be tailored to fit the specific needs of customers.

The pressure cans shown were adaptations of the standard 211 (beer type) and 202 (citrus concentrate type) sizes. Much interest was shown in the firm's complete range of types and sizes that readily can be used for certain types of food and dairy products, pharmaceuticals, cosmetics, deodorants, lubricants, paints, waxes and other household and military items, stated T. F. Brennan, manager of Canco's packaging development division.

Particular attention was given to the company's new "jet-container" line by customers seeking methods to give their products unique shelf space identification and eye-appeal, Mr. Brennan said.

Left to right: E. K. Walsh and G. U. Baylies, both of Canco; William P. Schott of the Socony Vacuum Oil Company and T. F. Brennan, mgr. of Can company's development division.

INTRODUCING . . .

a new team for BETTER BALANCED PAINT PRODUCTION

Marbon "9200" PAINT CHIPS

Marbon "9200" PAINT RESIN

Offering Greater Advantages for EVERY Paint Formulator

- Ideal for smaller manufacturer.
- Easily prepared for wide variety of finishes.
- Colors and pigments already dispersed in resin.
- Ready for direct mixing into solvents.
- Spraying and dip-coating formulation easily prepared.
- Enjoy faster drying concrete paints with higher gloss plus excellent hiding power.

- Ideal for large manufacturer.
- Offers wider compatability with paint resins, plasticizers and extenders.
- Greater resistance to acids and alkalies.
- More fluid flexibility of compounding to any desired finish.
- Tremendous adaptability and durability, plus easily controlled drying time.
- Excellent can and dip-tank stability.

Use for Traffic, Stucco, Concrete Paints, Acid-Resistant Enamels, Industrial Aluminum Finishes, Plaster Wall Sealers, etc.

Marbon

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GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

MARBON . . . Your Buy-Word for Product Perfection

E. D. Griffin

E. D. Peck

E. Griffin of PPG Retires; E. Peck Elected Vice-Pres.

Retirement of Emmet D. Griffin as vice president in charge of Pittsburgh Plate Glass Company's paint division has been announced by Harry B. Higgins, president.

One of the nation's leading paint manufacturing executives, Mr. Griffin will retire from active company work but will continue to serve as a member of the board of directors for at least a year and will also function as a general consultant.

Associated with Pittsburgh Plate Glass Company since 1903, Mr. Griffin joined the firm at the Cleveland, Ohio warehouse. He assisted in opening the Dallas warehouse and later served as manager of Pittsburgh's warehouses at Houston, Kansas City and Philadelphia.

He was elected a vice president in 1935 and was largely responsible for the firm's success and growth in the highly competitive paint industry.

E. D. Peck, general paint manager for the merchandising division of the firm during the past twelve years, has been elected as vice president to succeed Mr. Griffin. Mr. Peck has been associated with the paint industry since 1907 and with Pittsburgh Plate since 1939. Prior to his service with Pittsburgh Plate, he was vice president and general manager of Devoe and Raynolds Company of New York.

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Plaskon Ups Cordier and Hoppens

The filling of two technical positions has been announced by Dr. M. H. Bigelow, technical director of the Plaskon Division, Libbey-Owens-Ford Glass Company. David E. Cordier and Dr. Harold A. Hoppens have been advanced to the posts of director of research and director of technical service respectively. Both were formerly associate directors of research.

Dr. Bigelow said that the move would provide greatly increased emphasis and supervision for the development and servicing of all types of Plaskon products, including the recently announced reinforced alkyds and other fiber glass and plastic resin materials.

Cordier has been with company since 1933 spending practically all of those 19 years in research and development on plastic molding compounds. He holds many patents for his work and it was under his direction that the "alkyd family" of plastics was developed. Alkyds are the most important new types of plastics to be introduced since the end of World War II, and "reinforced" or fiber glass alkyds are the latest of six alkyd compounds now commercially available.

Dr. Hoppens came to the Plaskon Division 10 years ago and has specialized in research and technical service work on coating resins, becoming associate director of research for that group of materials in 1950.

•

Murtha Named Head of New Paint Manufacturing Co.

Norman V. Murtha has been named president of the recently organized Coronet Paint Mfg. Corp.

Now in full production, a complete line of white paints, both interior and exterior, is being marketed under the trade name of "Kingpin Architectural Whites." Franchises are presently being negotiated wherein protection in sales and territorial rights are being stressed.

The Coronet plant is located in Brooklyn, N. Y., with executive offices located at 1457 Broadway, New York City.

PICCOLYTE

the Ideal Resin Bases for

VARNISH
ENAMEL
FLAT PAINT
FINISHES

because Piccolyte is

★ neutral
★ pale
★ non-yellowing
readily soluble
★ compatible
★ resistant to acids and alkalies
★ Low in Cost

Write for samples and full details

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INDUSTRIAL CHEMICAL CORP.
CLAIRTON, PENNSYLVANIA
Plants at Clairton, Pa., West Elizabeth, Pa., and Chester, Pa.
DISTRIBUTED BY PENNSYLVANIA FALK CHEMICAL COMPANY, PITTSBURGH 30, PA.

NEWS DIGEST

UCC's Coal Hydrogenation Process Increases Coal Chemicals for Paint

"Production of chemicals by coal hydrogenation is now a reality," said Dr. J. G. Davidson, president of Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation in announcing the successful operation of the Company's 11 million dollar coal-hydrogenation chemicals plant at Institute, West Virginia.

Carbide and Carbon Chemicals has long been one of the largest producers of aliphatic organic chemicals. This announcement marks the Company's first major venture into the aromatic chemicals field and is one of the major projects included in its large expansion program instituted after the War. However, chemicals from coal was not the primary objective of the research on the coal-hydrogenation project when it was started back in 1935 by Dr. G. O. Curme, Jr., now vice-president of research, UCC.

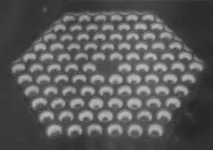
The Company's executives then believed that the days of economical natural or refinery gas — the basic raw materials for aliphatic organic chemicals — might be numbered. The management was looking to coal as an alternative source for these gases. After years of long, arduous research and development work on the hydrogenation process, the gases sought were successfully produced. In addition, the liquid hydrogenation product was rich in coal chemicals — so rich, in fact, that the research emphasis was shifted from gas production to the production of chemicals. Research continued and the present plant, with a capacity of 300 tons of coal a day, was built. More than 100 chemicals have been identified in the hydrogenation process — many commercially recoverable.

But, of most importance is the immediate future, where the coal-hydrogenation process gives promise of brighter days ahead for the hundreds of industries whose production is dependent upon coal chemicals — the plastics, rubber, dyestuff, perfume, paint, and synthetic detergents industries, to name a few. For several years, they have been hampered by the limited supply of coal chemicals, and the demand curve has turned sharply upward since World War II. New uses have increased the requirements for some coal-derived chemicals by as much as 25 to 36 per cent per year.

Aerial view of Union Carbide and Carbon's coal-hydrogenation plant at Institute, W. Va.

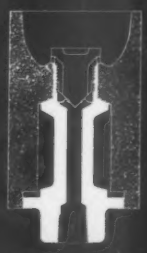
Duradiant Heating

BRINGS PRECISION TO BATCH COOKING



THE CLUSTER

The basic design presents considerable flexibility in arranging burner pattern for specific requirements.



THE DURADIANT BURNER

To provide rapid heat transfer, it is designed to burn gas-air mixture so that a high proportion of the total heat produced is in the form of radiant energy.

DURADIANT HEATING is the Selas method that makes possible precision control, improved quality of the heated product and outstanding economy in heating processes. Results have justly earned wide usage of DURADIANT CLUSTERS for heating varnish and other fluid materials.

Improved results start with the radiant heat produced and applied by the SELAS Combustion System. Rapid, uniform heat transfer; precision control gained in the simplest way . . . exactly reproducible heating conditions . . . operator comfort . . . low maintenance are all possible with DURADIANT HEAT.

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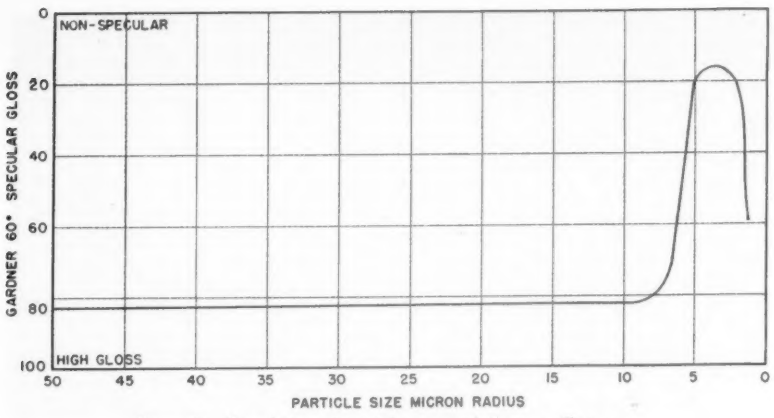

Figure 3. Correlation of particle size with flatting efficiency

FLATTING AGENTS

(*From page 20*)

flexibility, and better washability. This same idea can be carried over into the manufacture of finishes for interior use where excellent washability and other properties of a high quality product are obtainable only by increasing the percentage of vehicular solids. Bathroom and kitchen finishes are two of the items that lend themselves to this type of formulation. Film clarity is also highly desirable and a top quality product demands that the flat lacquer finish be as transparent as possible to show up the grain in the wood. A hazy or slightly opaque lacquer is not desirable. Film clarity is best obtained when using synthetic silicas because in themselves they are quite transparent and are highly efficient, meaning a lower percentage loading in the film.

Settling

CAN stability or anti-settling characteristics are of utmost importance in the manufacture and sale of flat lacquers. This problem is more severe where the lacquer is packaged at spraying viscosity which may be as low as "A" bubble tube viscosity or 20 to 25 seconds viscosity in a Ford No. 4 cup. At these viscosities and at an average flatness of approximately 60, all types of flatting agents settle. It is only natural that a solid suspended in a thin liquid would settle, especially in these dilute concentrations. Mill bases or high-viscosity lacquers seldom present a settling problem.

The practical problem of settling is not that these materials do settle, but is in the nature of the settled material. A flatting agent that can be redispersed by simply upending the container or by stirring in an agitator drum does not present any practical difficulty. Perhaps no phenomenon in the paint and lacquer business is less understood than that involving the phenomenon of the settling. Factors that cause settling are many. Some of the most obvious characteristics one thinks of that might combat settling are not generally applicable to this problem.

For example, one would think density to be especially important, but within the general range of densities encountered in flatting agents, it can be readily shown that this is not an effective property. A flatting agent that is extremely low in density often settles faster than one that is three times as dense. Vehicular and solvent composition is very important and perhaps the controlling factor in settling behavior. One vehicle will behave satisfactorily with one flatting agent while another flatting agent will not perform as satisfactorily without making certain changes in its composition. The mill bases, being heavy and viscous, do not let the flatting agent settle to any great extent and the makeup of the mill base is not especially important in the settling characteristics of the final let-down lacquer. The over-all settling behavior in lacquers is determined by the final composition of the diluted lacquer formula, and very slight variations in one component can cause hard settling or promote a very soft type of settling.

If we were dealing with aqueous solutions, the word "peptization" would be applicable to settling phenomenon. It is my belief that the term "peptization" is one of the best to describe this effect, but since an organic solution is involved, the vast amount of physical and chemical theory on peptization does not apply. It can be shown that a change of 5% in one of the final solvent components can produce hard settling. The same phenomenon has been observed in the use of synthetic resins where one resin will give excellent formulations as far as settling goes and a change to another in the same family of resins will produce hard settling.

Production of a compatible formula as far as can stability and lack of hard settling goes is of utmost importance to the lacquer manufacturer and since variations in raw materials can produce adverse effects, it means that the formulator must be constantly vigilant. In the majority of cases fine silica presents no settling problem whatsoever, but since this phenomenon of pigment suspension is so closely associated with the final chemical environment of the let-down lacquer, it is one that must be kept in mind at all times. Synthetic silicas can be made with great purity and with utmost uniformity from batch to batch, thus assuring the lacquer manufacturer that a formula and process once established will go along in a relatively trouble-free manner.

•

R. J. Painter Named Treasurer of ASTM

The American Society for Testing Materials has announced the appointment of Robert J. Painter as new treasurer of the Society, effective April 15. He succeeds John K. Rittenhouse, who has retired after 43 years of service with this national technical group. It was also announced that Dorothy P. Douty would be assistant treasurer.

•

Davison Appoints Syloid Agent

Appointment of Krekel-Goetz Sales and Supply Co., Grand Rapids, Michigan, and Van Horn, Metz & Co., Inc., Philadelphia, as Manufacturer's Agents for Syloid 308 and associated products is announced by The Davison Chemical Corporation.

You can depend on ORONITE DRIERS because:

1. They are the only Naphthenate Driers whose raw materials come exclusively from one controlled source of supply.
2. Quality is maintained to the most exacting standards at all times.
3. Experience in Naphthenate manufacture covers more than 20 years.
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T. A. McCormick

C. T. Ubel

United Wallpaper Announces Appointments in Color Div.

Curt T. Ubel has been named general sales manager of the new Color Div. of United Wallpaper, Inc. and Thomas A. McCormick has been appointed chief chemist of this division. The new division is manufacturing a full line of colors for paper coatings, and rubber base latex type paints.

Mr. Ubel was formerly sales representative of General Dyestuff Corp. Mr. McCormick was for 20 years assistant chief chemist of General Dyestuff Corporation's lake color department.

•

Shellac Specifications To Be Discussed by ISO, June 23-25

Specifications for seedlac and shellac, dealing with definitions of terms and methods of testing, will be discussed by international standardization experts from seven countries meeting in New York June 23-25.

The meetings will be held at the Hotel New Yorker in conjunction with the Fiftieth Anniversary of the American Society for Testing Materials, and the second triennial General Assembly of the 33-nation International Organization for Standardization (ISO).

The committee will try to coordinate producer and consumer points of view on moisture content, methods of sampling, wax content, rosin content, flow tests, color, melting point and bleaching tests.

•

Dr. Walton Named Gen'l Mgr. of 3M Adhesives and Coatings Div.

Appointment of Dr. Charles W. Walton, St. Paul, as general manager of the adhesives and coatings division of Minnesota Mining & Manufacturing Co. was announced recently.

R. P. Carlton, 3M president, named Walton to succeed Louis F. Weyand of Detroit. Weyand recently was made executive vice president in charge of all 3M tape operations.

ADM Expansion

A major expansion and modernization program was announced recently by Archer-Daniels-Midland Company, Minneapolis. According to T. L. Daniels, president, work has already started on a refinery and bodying plant at Los Angeles and on a solvent extraction plant at Buffalo, New York.

The Los Angeles plant, scheduled for completion by September, 1952, will produce bodied oils, chemically modified oils and products now being manufactured by the Progressive Varnish Division of Archer-Daniels.

Four new buildings will be constructed at Buffalo and are expected to increase the firm's production of linseed oil and linseed oil meal by 50% at this plant.

The plant, using the solvent process of extraction, will be the first of its type erected east of Cleveland according to Daniels, and is expected to be ready to handle the 1953 crop.

AMSCO Appoints Stuhlfaut Midwestern Representative

Willard C. Stuhlfaut has been appointed a sales representative in the midwestern territory, it was announced by Max A. Williams, Vice President in charge of Sales of American Mineral Spirits Company. Bill Stuhlfaut, who is a resident of Glen Ellyn, Illinois, will cover a portion of the States of Illinois and Missouri and also Indiana and Kentucky for American Mineral Spirits Company.

•

Celanese Appointments

W.D. Matthews has joined the organic chemical department as a sales representative. Alan K. Jeydel and Michal J. Curry have joined the product development department as product development engineers, and G. H. Wiech as a technical service engineer.

WHY YOU CAN'T GO WRONG WHEN YOU USE SUN SPIRITS

Sun Spirits is a carefully balanced product. It has good wetting-out power. Volatility is controlled to insure a rate of drying that is neither too fast nor too slow. Purity is constantly checked and rechecked to make certain of a reliable, high-quality product. In new formulas, as well as old, and in experimenting with new materials, you can rely on the uniformity and quality of Sun Spirits. For full information, or the help of a representative, get in touch with the nearest Sun Oil Company Office.

The owner of this plant was using a solvent that often gave his varnishes a dark cast or caused them to gum. Changing to Sun Spirits solved the problem for him. Largely due to the greater uniformity of this "Job Proved" product, his varnishes have gained in reputation in the 11 years that have passed since adopting Sun Spirits.

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NEWS DIGEST

Richard A. Moore

S-W Names Moore Head of Chicago Technical Service

Richard A. Moore, well-known supervisor of The Sherwin-Williams Co. development laboratory in Chicago has been named director of the Chicago Technical Service department of the paint manufacturing company. Announcement of his appointment to the post was made recently by H. E. Spitzer, director of development at the firm's Chicago Paint, Varnish and Lacquer Laboratories.

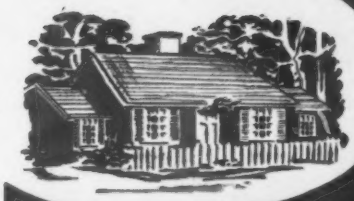
Mr. Moore, who holds a degree in Chemical Engineering from Purdue University, has been associated with Sherwin-Williams since 1939. His work in the appliance paint formulation field was interrupted by war service as a captain in the field artillery. Since then he has headed the company's appliance development work, later moving to the supervisory post in the development laboratory.

•

Shell Chemical Appoints Keel Advertising Mgr.

Mr. M. H. Keel has been appointed Manager of a newly formed Advertising Department in Shell Chemical Corporation. In making the announcement Mr. L. V. Steck, Vice President, said that the company's rapid growth has brought about a need for greater participation of advertising and sales promotion in marketing its expanding list of products to industry and agriculture.

In his new position, Keel will direct Shell Chemical's advertising, publications and sales promotion program for agricultural chemicals, fertilizers, solvents, industrial chemicals and plastics and resins.



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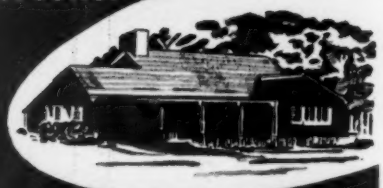

Your red paints for house and barn will retain their color longer, and weather more uniformly, if you formulate with low cost True Venetian Reds.

Exposure tests on our test fences for periods up to ten years clearly indicate that no other red pigment can equal these *true* Venetians for color retention and durability. Three other desirable qualities of True Venetian Reds revealed by these tests are: (1) even chalking (2) minimum dirt collection (3) excellent repainting surface.

Ask your Williams representative to show you panels of our four shades of 40% Venetian Reds, ranging from light to dark. Or, write today for technical information. Address Dept. 23, C. K. Williams & Co., Easton, Pa.

ANALYSIS OF TRUE VENETIAN REDS

40% Fe_2O_3 and 60% $CaSO_4$ (anhydrous)

SPEC. GRAVITY: 3.45

OIL ABSORPTION: 20-22

FINENESS: 99% thru 325 mesh

COLOR RANGE: Bright Red from light to dark

*Not to be confused with pseudo-Venetians that are merely physical blends of iron oxide and extenders. Williams' True Venetian Reds are made by calcining ferrous sulfate and hydrated calcium oxide which chemically produces ferric oxide coalesced on anhydrous calcium sulfate.

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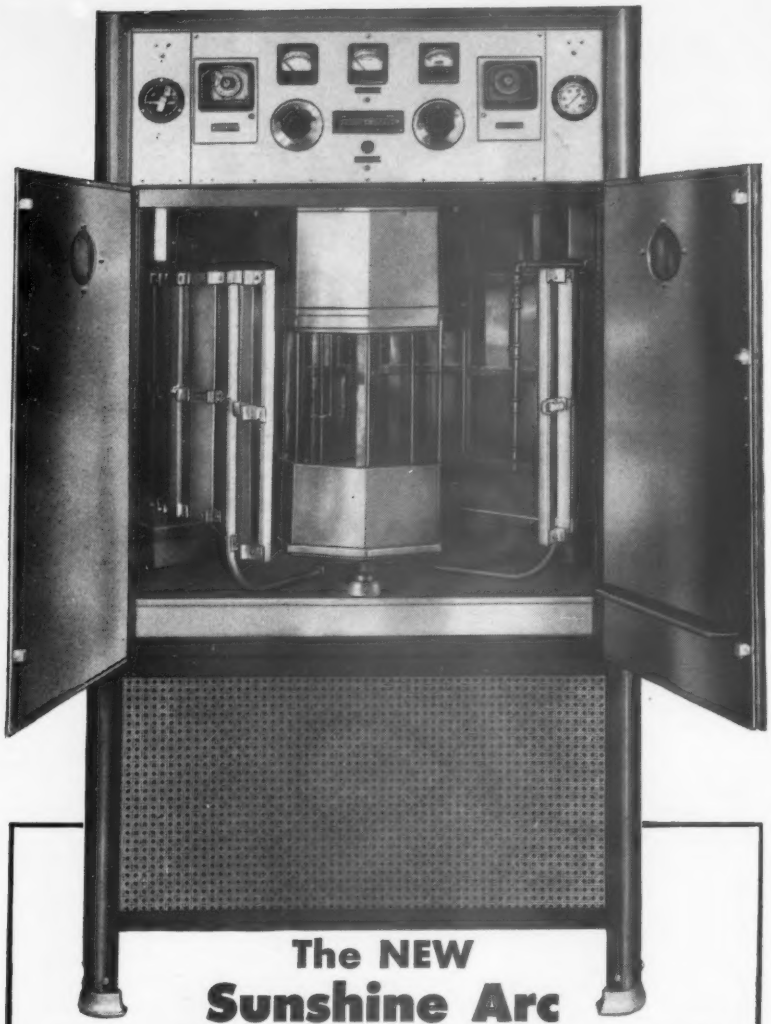

The NEW
Sunshine Arc
Weather-Ometer Type XW

A modernized and redesigned version of the open flame X-1 and X-1-A Weathering Units

Many of the control features that have proven their dependability in the Atlas Twin Arc Weather-Ometer have been combined with some features of the original X-1-A weathering unit to make a new Weather-Ometer of advanced design.

In the Type XW a new means of maintaining constant temperature is provided. Far more accurate temperature control is now available.

Radiation is from a Sunshine Carbon Arc which is of the motor-driven, open-flame type. Natural sunlight or intensified ultra-violet radiation is available depending upon the type of carbons and filters used. The light source has been improved to provide 16 hours of continuous operation as well as a number of other added conveniences.

All instruments are located on a convenient control panel, including an arc voltage setting switch and meter, cycle control of light and water spray, 1 to 24 hour shut-down time switch, thermo-regulator and running time meter.

Type XW is fully automatic and may safely be left in unattended operation overnight. If deionized water is to be used, aluminum spray piping can be furnished. The capacity of the stainless steel lined testing chamber is 54 panels. The machine is sturdily constructed and is shipped assembled, ready for connection.

ATLAS ELECTRIC DEVICES CO. 361 W. Superior St., Chicago 10, Ill.

FADE-OMETERS • LAUNDER-OMETERS • WEATHER-OMETERS

CALENDAR OF EVENTS

June 6-7. Third Annual Joint Meeting of the Kansas City-St. Louis Paint and Varnish Production Clubs, Chase Hotel, St. Louis, Mo.

June 16-20. Gordon Research Conferences on Organic Coatings, New Hampton School, New Hampton, N.H.

June 23-27. ASTM Annual Meeting, Hotel Statler, New York.

Sept. 14-19. Fall Meeting of Div. of Paint, Varnish and Plastics Chemistry, ACS, Chalfonte-Haddon Hall, Atlantic City, N.J.

Nov. 17-19. National Paint, Varnish and Lacquer Ass'n. Annual Convention, Palmer House, Chicago, Ill.

Nov. 20-22. Federation of Paint and Varnish Production Clubs Annual Meeting, Palmer House, Chicago, Ill.

Nov. 18-22. Paint Industries' Show, Palmer House, Chicago, Ill.

Production Club Meetings

Baltimore, 2nd Friday, Belvedere Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Cincinnati Club;
Dayton — Nov., Feb., April, Van Cleve Hotel;
Indianapolis — Sept., Claypool Hotel;
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, El Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Building Trades Employers Assn.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 2nd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

Brooklyn Polytechnic Student Receives Nuodex Award

Dr. Henry F. Payne (left), adjunct professor of chemical engineering at the Polytechnic Institute of Brooklyn, under whose direction all courses dealing with paint technology are presented, awards graduate student (in center) Philip A. Masters with five volume set of "Protective and Decorative Coatings" by the late Dr. J. J. Mattiello, Polytechnic alumnus and a well known figure in the paint and chemistry field for 25 years. The paint prize was awarded Masters for his excellent grades in paint courses and for writing an outstanding research paper. William Grit (right) is assistant to the chief of protective coatings laboratory of Nuodex Products Co. sponsor's of the award which is made annually to colleges with courses in paint technology. Only fifteen colleges in the United States teach courses which merit the Nuodex Award, now in its fifth year. Dr. Donald F. Othmer head of the Dept. of Chemical Engineering at the Institute attended the presentation.

Presentation of Nuodex award to Brooklyn Polytechnic student.

•

Cyanamid Appoints N. Sommer To New Products Post

Dr. Nolan B. Sommer was named supervisor of the new product development department. He replaces Dr. James R. Dudley who recently joined the Carwin Company, North Haven, Connecticut.

Dr. Sommer served as a research chemist in Cyanamid's Stamford, Connecticut Research Laboratories from 1944 to 1947 then was made market development manager for Jefferson Chemical Company, a firm jointly owned by American Cyanamid and The Texas Company.

•

Ryburn Representing Eastman In New England Area

Mr. S. M. Ryburn has been appointed New England representative for all Eastman Industrial Chemicals. These products are manufactured by Tennessee Eastman Company of Kingsport, Tennessee and Texas Eastman Company of Longview, Texas. Both are divisions of Eastman Kodak Company.

Among those products available through Mr. Ryburn are Eastman plasticizers, solvents, acids and anhydrides; Tenox, Eastman food-grade antioxidants; and Tenamene, Eastman gasoline additives.

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...NOW MORE THAN EVER
Partial view of plant at Neville Island, on the Ohio River, 8 miles west of Pittsburgh, Pa., showing main resin manufacturing and solvent refining units.

Neville service to industry is characterized by a traditional policy of continuous development and expansion, and co-operative technical assistance that means much to the buyer of chemicals.

You can be sure of quality on any Neville product you use—whether a resin, oil, solvent or specialty!

THE NEVILLE COMPANY NEVILLE PITTSBURGH 25, PA.

Plants at Neville Island, Pa., and Anaheim, Cal.

PATENTS

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PATENTS AND COPYRIGHTS

424 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Coating For Cement Surfaces

U. S. Patent 2,588,828. Norman S. Greiner, Somerville, N. J., assignor to Johns-Manville Corporation, New York, N. Y., a corporation of New York.

A heat curable coating composition which is applicable by conventional spraying or brushing methods comprising a suspension of finely divided mineral fillers and emulsified organosiloxane polymer belonging to the group consisting of heat polymerizable alkyl and aryl siloxanes in a vehicle comprising an aqueous solution of alkali silicate having a molar ratio of alkali oxide/SiO_2 within the approximate range 1:3.20-3.90, said alkali silicate on the dry basis forming 50-60% by weight of the composition, and the siloxane being present in amount 3-6% dry basis to impart toughness, durability and weather resistance.

The method of producing a durable, weatherproof, and decorative coating for an asbestos-cement base sheet which comprises, applying to one surface of said sheet a thin aqueous coating composition to form a thin veneer, said composition comprising finely divided mineral pigment and emulsified polysiloxane belonging to the group consisting of alkyl and aryl siloxane polymer resins in an aqueous solution of alkali silicate having a solids concentration of 32-40% and having a mol ratio of SiO_2/alkali oxide within the range 3.2-3.9:1, said

Tall Oil Nitriles

U. S. Patent 2,590,570. Stearns T. Putnam, Wilmington, Del., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware.

A stabilized tall oil nitrile of the group consisting of dehydrogenated tall oil nitrile and hydrogenated tall oil nitrile, substantially free of emulsion polymerization inhibitors and abietonitrile.

Tall Oil Amines

U. S. Patent 2,590,571. Stearns T. Putnam, Wilmington, Del., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware.

An amine of a stabilized tall oil, suitable for use in cationic emulsification of peroxide-catalyzed emulsion polymerization systems, of the group consisting of hydrogenated tall oil amine and dehydrogenated tall oil amine, said amines being substantially free of emulsion polymerization inhibitors and abietylamine.

Wax Compositions

U. S. Patent 2,580,996. John Mann Butler, Dayton, Ohio, assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A coating composition comprising a hydrocarbon wax and an alkylated polystyrene made by reacting polystyrene with a propylene polymer, said wax being present to the extent of from 4 to 99.98 percent by weight of the total of the wax and alkylated polystyrene

Wax Compositions

U. S. Patent 2,577,643. David W Young, Roselle, and Arnold J. Morway Rahway, N. J., assignors to Standard Oi Development Company, a corporation o Delaware.

A wax composition consisting essentially of refined paraffin wax and 1 to 5% of a metal salt chosen from the class consisting of alkali metal and alkali earth salts of a heterocyclic carboxylic acid, said heterocyclic acid being a low molecular weight acid having a five-membered furan-type ring.

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Improved Drying Oils

U. S. Patent 2,588,826. Robert C. Goodwin, Lubbock, Tex., assignor to Phillips Petroleum Company, a corporation of Delaware.

The method of manufacturing an improved drying oil from unsaturated polymers obtained in the clay treating of cracked gasoline at elevated temperatures and boiling within the range of 350 to 600°F. which comprises forming a mixture of said polymer in the liquid phase with an acid condensation catalyst, agitating said mixture while introducing an aldehyde in the vapor phase to produce an oil having improved drying properties, and maintaining a temperature within the range of 30 to 220°F. while the reaction takes place.

Fireproofing Composition

U. S. Patent 2,593,400. Jules J. Rakos, Beyoglu-Istanbul, Turkey.

A fireproofing coating composition useful in protection against persistent types of flame, such as gasoline flame, comprising 48% sodium silicate, 20% trisodium phosphate, 20% lithopone, 10% finely divided quartz, 1% formaldehyde, and 1% sodium hydroxide, said percentages being by weight, said composition being characterized by its anti-flaking and anti-peeling qualities when a dried film of said composition is exposed to flame of high temperature, such as gasoline flame.

Aluminum Paste

U. S. Patent 2,591,245. Junius D. Edwards, Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

An aluminum paste pigment formulation comprising a main body of leafing aluminum flakes constituting from 68 to 85 per cent of the paste, about 14 to 28 per cent mineral spirits, and at least one leafing agent of the group consisting of stearic and palmitic acids, said leafing agent having been added at least in part in solid phase in amounts between 1.0 to 4.0 per cent of the total weight of the pigment formulation and the paste formulation wet polished for a period of about 1 to 12 hours at a temperature below about 110°F., and said pigment formulation being characterized by improved stability, brightness and specular reflectivity.

Anti-Fouling Coating

U. S. Patent 2,592,655. Earl Francis Carlston, Arlington, Va., and Leo Robert Whiting, Woodbridge, N. J., assignors to the United States of America, as represented by the Secretary of the Navy.

An anti-fouling paint composition comprising at least 60% by weight of a solid particulate toxic agent selected from the group consisting of copper, cuprous oxide and a mixture of cuprous oxide and mercuric oxide, up to 18% by weight rosin, and the total being made up to 100% by the addition of a binder selected from the group consisting of copolymerized vinyl chloride-vinyl acetate and polyvinyl butyral.

Pasty Vehicle for Artist's Paint

U. S. Patent 2,594,273. Bernhard J. Mellwig, Easton, Pa., assignor to Binney & Smith Company, Easton, Pa., and New York, N. Y., a corporation of New Jersey.

A water-soluble, pasty paint vehicle for artist's paint comprising a soap of triethanolamine and a soap-forming fatty acid about 23-52 lbs., soap forming fatty acid about 1-11 lbs., starch about 20-25 lbs., carbohydrate gum about 24-30 lbs., a polyhydric alcohol of the group consisting of glycerine and sorbitol about 5-10 lbs., formaldehyde about 3-3.5 lbs., and water about 100-125 lbs.

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•

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abstracts

Oxidation of Polyethylene

Myers, C. S., Bakelite Co., Bound Brook, N. J. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

This study was undertaken with the objective of defining the mechanism of oxidation and related electrical loss characteristics of polyethylene resins. The power factor of polyethylene at 50 megacycles per second was found to increase at an exponential rate with temperature when milled on a two-roll mill at various temperatures. Carbonyl oxygen concentration, resulting from milling of polyethylene, was found to be essentially linear with power factor at 50 megacycles up to a value of 0.105% carbonyl and a power factor of 65 x 10^{-4} under terminal conditions. Extremely small concentrations of a conventional aromatic amine antioxidant were shown to be effective in preventing increases in power factor and carbonyl oxygen content during extensive milling treatment at 150°C.

Reaction rate constants for the thermal oxidation of polyethylene DYNH were calculated according to the classical theory of chemical kinetics and were found to be consistent with similar rates derived from the literature on the thermal oxidation of a synthetic hydrocarbon wax and photo-oxidation of a natural rubber vulcanizate. The mechanism of oxidation was found to be autocatalytic and to involve the formation, presumably, of unstable peroxides which result, eventually, in a build-up in concentration of stable oxygenated groups predominantly carbonyl in structure. Good correlation between carbonyl oxygen concentrations and power factor measurements at 50 megacycles per second warrants consideration of dielectric absorption as an analytical tool analogous to spectral measurements in the optical range.

Both the distilled and the undistilled polymers were briefly evaluated as plasticizers for polyvinyl chloride-acetate. Most of the undistilled polymers were compatible but relatively inefficient. The most efficient materials were the distilled fractions which boiled near or above the boiling point of di-2-ethyl hexyl phthalate. These fractions, particularly those obtained from butyl polyacrylate, showed good compatibility and milling characteristics and produced soft, flexible plastics with brittle points in the range (–15° to –20°.)

The polymers appear promising as plasticizers, hydraulic fluids, and synthetic lubricants.

Chain Transfer and Branching In Vinyl Acetate

Stockmayer, W. H., Clarke, J. T., and Howard, R. O. Presented before Div. of Paint, Varnish and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

Chain transfer constants of vinyl acetate to about 70 substances have been determined at 60°C. In general, the order of reactivity is the same as for styrene, but the constants are about a hundredfold greater. For example, carbon tetrachloride gives a transfer constant of unity with vinyl acetate while the value with styrene is 0.009.

Of great interest are the transfer constants of vinyl acetate radical to its monomer (2.5 x 10^{-4} per polymerized monomer unit). It is likely that the transfer to monomer occur almost completely on the acetyl group, while for the polymer the tertiary hydrogens make a major contribution.

Chats about Finishes

HOT LACQUER FOR DEFENSE USE

by

J. B. WIESEL

Asst. to the General Manager

Hercules' Cellulose Products Dept.

With the adoption of hot-sprayed lacquers for aircraft, tanks, ammunition, and other military items, new and important production gains have already become evident. Douglas Aircraft Company, for example, reports finishing time reduced by as much as 50%. Small wonder, then, that Ford's new tank assembly plant at Livonia, Michigan, will use hot lacquer exclusively for finishing—saving the substantial expense of baking ovens, besides.

Time and performance studies reveal many collateral benefits in fewer coats, saving in solvents, greater per gallon coverage, better flowout, and no blush.

The increasing trend to hot lacquer presents new opportunities for industrial sales and new markets in defense and civilian plants. Write, and I'll send latest details on the process and its applications.

J. B. Wiesel

Cellulose Products Department

HERCULES POWDER COMPANY

INCORPORATED

926 Market Street, Wilmington 99, Del.

IC52-3

With the above constants, average molecular weights and degrees of branching can be predicted for polyvinyl acetate at various conversions. As far as can be ascertained, these predictions are in satisfactory accord with the hydrolysis studies of Wheeler (O. L. Wheeler, S. L. Ernst, and R. N. Crozier, paper presented before the Division of High Polymer Chemistry, American Chemical Society, Boston, April 1951), and with preliminary assays of branching by means (B. H. Zimm and W. H. Stockmayer, J. Chem. Phys., *17*, 1301 (1949) of light scattering and intrinsic viscosity.

Derivatives of Long-Chain Acids

Port, W. S., Jordon, E. F., Hansen, J. E., and Swern, D., Eastern Regional Research Laboratory, Philadelphia, Pa. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

A study was made of the copolymerization of vinyl acetate with vinyl palmitate, vinyl stearate, and vinyl oleate, respectively. True copolymerization was shown to have occurred on the basis of the solubility characteristics of the crude copolymers over a wide range of compositions. The monomer reactivity ratios for the comonomers vinyl palmitate (r_1) and vinyl acetate (r_2) were determined by two methods. One, based on an analysis of the copolymer, gave $r_1 = 0.78 \pm 0.10$ and $r_2 = 1.15 \pm 0.13$; the other based on an analysis for each monomer in the mixture remaining after polymerization, gave $r_1 = 0.66 \pm 0.07$ and $r_2 = 0.84 \pm 0.10$.

When the vinyl palmitate or vinyl stearate content of the copolymer exceeded about 20 to 25 mole %, the copolymers exhibited first-order transition points which were determined using a refractive index technique as well as a polarizing microscope method. Where no transition point could be observed, brittle point measurements were made.

Paper Chromatography of Polymethylol Phenols

Freeman, James H., Westinghouse Research Laboratories, East Pittsburgh, Pa. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

The relatively new technique of paper chromatography can be employed to obtain specific information concerning one of the oldest and most perplexing problems confronting the worker in phenolic resins. Precisely which of the various possible mono- and polymethylol phenols are formed when phenol reacts with formaldehyde under a given set of conditions? By use of 4; 1, 1-butanol, ammonium hydroxide as solvent and p-nitrobenzenediazonium fluoroborate as indicator, each of the individual methylophenols present in a mixture may be qualitatively determined.

In this manner the presence of 2,4,6-trimethylolphenol and 2,4-dimethylolphenol as well as the already known p-hydroxybenzyl alcohol, saligenin, and unreacted phenol in an alkali-catalyzed mixture of phenol and formaldehyde has been demonstrated. In addition, evidence for the existence of 2,6-dimethylolphenol in such a mixture has been obtained for the first time. Presence or absence of 3,3′, 5,5′-tetra (hydroxymethyl) 4,4′-dihydroxydiphenylmethane may be simultaneously detected.

Identity of each of the zones is conclusively proved by comparison with parallel spots made known pure compounds. The apparatus is simple, only minute amounts of sample are required for an analysis, and the chromatograms can be run overnight, thus releasing much of the chemist's time for other work.

R_f values for resin models of diphenylmethane type containing two, three, and four phenol nuclei per molecule, and methylol derivatives of some of these have also been determined.

Hydrogen Bonding in Phenolic Resin Intermediates

Sprengling, G. R., Westinghouse Research Laboratories, East Pittsburgh, Pa. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

Assumptions have often been made concerning hydrogen bonds of various types postulated to be present in phenolic resins, or their intermediates, and their effect on the properties and the further reaction of such resins. Real evidence is here presented for existence and nature of such hydrogen bonds in

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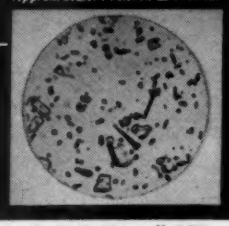

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Cl	.02
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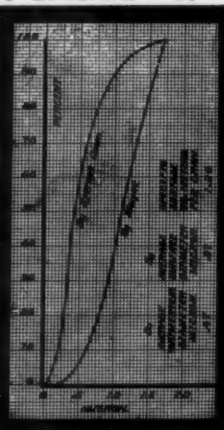
Total S as SO	.35
H_2O Soluble Salts	.70
Insoluble in HCl	.15
Loss at 110°C.	.30
Representative Physical Tests	
Particle Size	
Average numerical diameter D_1 – microns	.47
Average surface diameter D – microns	.87
Specific surface – Sq.M./gram	1.26
Percent fines under .50 micron	6.0
Specific Gravity	5.65
Apparent Density – lb./cu. ft.	40.
Cleanliness	
Percent thru 325 mesh screen	99.92
Oil Absorption – Rub-out	
Grams oil/100 grams ZnO	12.



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Plant & Laboratory: Monaca (Josephtown) Pa.

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certain phenolic intermediates.

Despite the apparent equivalence of the two phenolic hydroxyl groups in an o-dihydroxydiphenylmethane, titration in various media shows one of these hydroxyls to be far more acid than the other. In fact, the hyperacid hydroxyl more nearly approaches the acidity of a carboxylic acid. When the two phenolic rings are linked in any other way or position yet investigated there is no difference in their hydroxyls, nor are they hyperacid. A compound containing three phenolic rings linked by methylene bridges in the orotho-positions show the same hyperacidity, this time of only one of the three hydroxyls present.

These phenomena can apparently be explained only by the existence of strong, intramolecular hydrogen bonds between the phenolic hydroxyls of the same molecule, leaving one — the end one of a chain — abnormally loosely bound and thus hyperacid. Space models show that the strainless rings necessary for the existence of such intra-molecular hydrogen bonds are indeed possible.

The presence of the hydrogen bonds and rings discussed leads to several interesting conclusions. For instance; an ortho-linked Novolak must differ from all other possible structures in that its molecular configuration is relatively rigidly fixed at normal temperatures by the hydrogen bonds present. Conversely, the presence of intramolecular hydrogen bonds in this structure precludes the formation of as many intermolecular hydrogen bonds, thus decreasing intermolecular cohesion. Also, in such an ortho-linked structure further reaction with a phenol and formaldehyde might be expected to occur at the end of the chain instead of leading to chain branching.

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Properties of Modified Alkyds

Moore, D. T.; Emery Industries, Inc., Cincinnati 2, Ohio. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee, Mar. 30-April 3, 1952.

The methods of the previous publication are used in the preparation and evaluation of alkyds both "longer" and "shorter" than those previously studied. The conclusions of the previous paper apply equally well at these other oil-resin ratios and in addition the variations in drying time, hardness, and after-yellowing with oil-resin ratio are explored.

In the equations previously developed for the dependence of hardness and after-yellowing on polyenoic acid content, it is shown that a number of the constants carry over unaltered from one oil-resin ratio to another and that one parameter, in each case, contains the effects of oil-resin ratio changes.

With the combinations of this and the previous paper, there now exists a body of data which delineates the orderly progression of certain alkyd properties as one or another change is made in the relative proportions of the various raw materials.

Isophthalic Acid in Polymers

Lum, F. G. and Carlston, E. F., California Research Corp., Richmond, Calif. Presented before Div. of Paint, Varnish, and Plastics Chemistry, ACS, at Milwaukee. Mar. 30-April 3, 1952.

Data are presented which show the characteristic properties of isophthalic acid when used instead of phthalic anhydride in oil-modified alkyd resins. Isophthalic acid has greater reactivity than phthalic anhydride, lower volatility in the kettle and greater thermal stability at high cooking temperatures, and forms faster-drying, more durable resins. The practical effect of using isophthalic acid in oil-modified alkyd resins is to reduce the amount of glyceryl or pentaerythrityl phthalate required for a given alkyd resin viscosity or molecular weight. Data on the use of the para isomer, terephthalic acid are also included. Terephthalic acid alkyd resins show the same properties observed in resins made from isophthalic acid, but the greater solubility and faster reaction time of isophthalic acid make the meta isomer much more practicable. An explanation is advanced to account for the differences in properties of the isomers. Data on isophthalic glycol polyester and diamine polyamide high polymers are presented, which indicate that they have valuable properties worthy of further investigation.

PROTECTIVE COATING

(*From Page 21*)

Wood Finishes

DURING World War II, the Quartermaster Corps found that the wood finishes used on furniture did not have the proper cold check resistance and solvent resistance. Accordingly a research contract was let to an industrial firm to investigate baking finishes and lacquers which would meet the necessary requirements.

The furniture is to be used in dwellings in tropical, temperate subarctic, seashore and inland areas with a temperature range from -65 to plus 130 F and with vapor pressures up to 30 mm of mercury at 100 F. A suitable finish must have a drying time and method of application that will assure quantity production of the furniture. The finish shall be non-toxic, unaffected by fingernail polish remover, 100 broof alcohol or organic fruit acids, poiling water, etc. A durable chip-crack-, craze-, and peel resistant finish is desired that will also resist attack by burning cigarettes.

Coatings for Helmets

A study on helmets and helmet liners has shown that a nylon laminated helmet liner and an aluminum helmet have an equal resistance to penetration as the old steel helmet and plastic laminate liner with less weight. Another investigation was launched to develop a suitable finish for the liner and the helmet. In general an olive drab, lusterless, abrasion resistant finish is desired that simulates a textured surface. Good adhesion to nylon when subjected to weather and temperature extremes, aging, impact and normal usage are also prime requirements.

The objects of applying a finish are to substantially lower the water absorption, improve wear, lower costs by eliminating need for dyed nylon and to improve appearance.

Food Can Containers

In cooperation with the Food and Container Institute of Chicago, data is being collected on the coating of interior of food cans. The purposes of these coatings are to conserve critical materials, such as tin, and to be able to package certain items that are not conventionally packed in cans, such as mustard and ketchup. In general, it is hoped to prepare specifications around coating materials which the food processing industry has found to give satisfactory service.

During war time, it is also necessary to coat the exterior of food cans for camouflage purposes. Although such coatings are already covered by specification (Jan-C-237, Coatings; Exterior, Air-Drying, Camouflage and Rust-Inhibiting, for Food Cans) it is frequently difficult for the finisher to get the proper type of coating for automatic coating equipment which will possess the proper color and drying properties consistent with production schedules. A new specification entitled Coatings, Exterior for Food Cans, MIL-C-10506 (QMC) covering Procoating, Precoating, and Clear Coatings is in process of being issued.

Insecticide Containers

A study is being launched on coatings for insecticide containers in which the variables will be the type of metal, the exposure conditions and the type of coatings. The metals will be hot rolled steel, cold rolled steel, and tin plate. The exposure conditions will be at three extreme stations to give data

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on a hot moist climate, a hot dry climate, and a cold climate. The coatings to be examined will probably be in the open, phenolic, and vinyl classification.

Personnel.

The Protective Finishes Group is led by Mr. George Merritt. This group is part of the Chemical and Plastic Section of which Dr. Warren Stubblebine is Chief.

•

Edgar Names Distributor

Edgar Brothers Company, with offices in Metuchen, New Jersey and mines in Central Georgia, announce the appointment of Benlo Chemicals, Barada & Page, Inc., and Southern States Chemical Company as exclusive distributors for Edgar Brand ASP (ALuminum Silicate) products.

Benlo Chemicals maintain warehouses in Milwaukee, Wisconsin and will represent Edgar Brothers Company in the State of Wisconsin and Northern Counties in Illinois.

Barada & Page, Inc. will represent Edgar Brothers Company in New Mexico, Louisiana, Mississippi, Texas, Oklahoma, Arkansas, and Western Florida and will maintain warehouse stocks at New Orleans, Louisiana; Dallas, Texas; Houston, Texas; Tulsa, Oklahoma; and Oklahoma City, Oklahoma.

Southern States Chemical Company, with headquarters in Atlanta, Georgia, will maintain warehouse stocks at strategic points in Georgia, North Carolina, South Carolina, and selected counties in Tennessee, Alabama, and Florida.

•

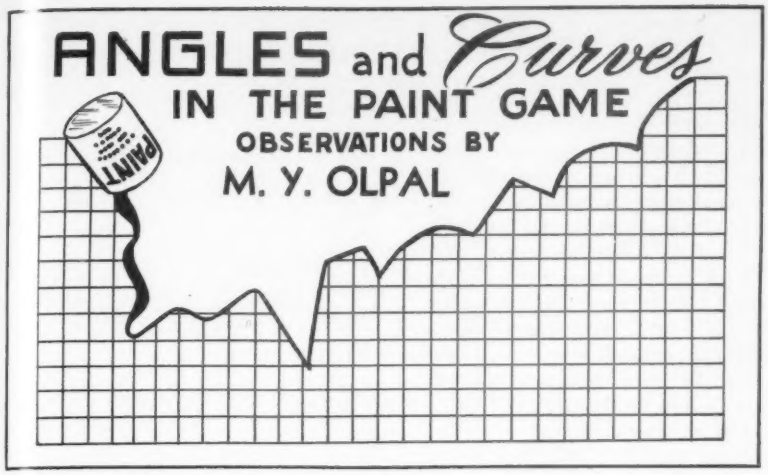
R. T. Wallace of Plaskon Awarded Sloan Fellowship

Robert T. Wallace, superintendent of the coating resin and alkyd molding compound plants at Plaskon Division of Libbey-Owens-Ford Glass Company, has been awarded one of the 14 annual Sloan fellowships for executive development at Massachusetts Institute of Technology.

The fellowship will provide Mr. Wallace witha year's study beginning June 7 on a stipend of $3,720 and Libbey-Owens-Ford will make up the difference between that sum and his present salary.

John D. Biggers, president of LOF, in congratulating Mr. Wallace, said "there was a large number of well qualified applicants from LOF and its various divisions, so it is a real honor to have been chosen."

Several weeks ago the company invited all qualified men who were interested to apply, then a committee sifted these applications, and the final selection was made by MIT on the fellowship basis "of demonstrated aptitude for growth in broader managerial responsibilities."



I could see Janie all right. Nobody could help but see her. From her facial expression, which I finally noticed, I wondered where her mind was — at the beach, in a jam session, or just resting.

The boss saw her too, but he had on an expression like an iron bulldog on a front lawn in the snow.

Suddenly the boss melted and he spoke — "You know, the real problem is one of coverage," he half sort of thought out loud.

"Yes", I agreed and since I didn't look away from what I had been looking at, Janie walked over to the water cooler.

The boss repeated, "Yep — its a problem in sales coverage." The word sales took the fuse away from the bomb the boss had planted. Janie calmed, sat down, and asked him — "Don't we have plenty of sales coverage?"

That's when I dragged my thoughts back to the problems of manufacturing industrial finishes. I realize that you not only have to manufacture stuff but you've got to be mighty sure it's going to be sold.

Then I thought of our sales manager. There's a guy that ought to have two desks — one for each foot.

The boss again — "If we were trying to sell sugar, we could sell it by price alone — we wouldn't need any service or technical assistance — everybody knows what to do with sugar. If we were trying to sell cigarettes or chewing gum we could spot it on the store counters and then hit our customers with some pin-up ads. But here we have to sell industrial finishes — so how do we do that?"

"Easy," said Janie, "you get after the sales manager and give him the old "hot-foot".

"Right", said the boss "lets figure we have equal price and performance to anybody else in the paint game. We also know we're up there with the best on delivering technical service. Then what angle do we need? We need sales contacts on a friendship basis. This means when our customer, who is also our friend lines up for a big purchase, or really wants to get a job done, or has a new requirement, friendship with our salesman will get the order thru to us like a greased pig thru a cornfield.

"The idea is swell," I said "but one man can't put the time and effort to build the personal friendships you're talking about except on a few accounts."

"That's what I'm talking about", the boss snarled. "We've got to get our sales "brain" to look into all possible accounts and then heave most of them into the wastebasket. But hold on like an old bulldog to those accounts where we can do a job. You know what I mean — good accounts with a dependable and soundly expanding volume where they need better and more exactly suited products. Then we'll take these accounts, put the cover on and cook them on the front burner. I mean our coverage will not be so wide — but it'll be a lot deeper before we turn on the heat. This kind of coverage will separate the customer from his money."

The last remark rang a bell with Janie because when it comes to a lady and her money, that's another proposition and they're not easily separated.

•

ASTM D-1 Committee Announces Program for 50th Anniversary

To accommodate the large number of technical papers on the properties and testing of materials which are to be presented at this 50th Anniversary Meeting in New York, June 23-27, the American Society for Testing Materials has already scheduled 30 technical sessions. In addition to these there will be in progress throughout the week the Society's 10th Exhibit of Testing Apparatus and Laboratory Supplies and its 8th Photographic Exhibit. Headquarters will be at the Hotels Statler and New Yorker. All exhibits will be at the Statler.

At the Annual Dinner, Wednesday, June 25, which this year includes special features in keeping with the Society's 50th Anniversary, the chief speaker will be Dr. Detlev W. Bronk, President of National Academy of Sciences and Head of Johns Hopkins University.

ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products will have a special program commemorating its own 50th Anniversary for it was established in 1902. There is to be a technical session, dinner, and special entertainment. The technical features will include a series of papers and discussions covering the principle activities of the committee; will particularly outline major accomplishments but will stress in many cases unsolved problems and provide a "look ahead." The 50th Anniversary Session on Paint, Varnish, Lacquer, and Related Products, sponsored by Committee D-1, will be on *Tuesday, June 24*, and will include the following papers:

Paint, Varnish, Lacquer and Related Products — C H. Rose, National Lead Co., and E. W. Boughton, R. T. Vanderbilt Co., Inc.
Drying Oils — Francis Scofield, National Paint, Varnish & Lacquer Assn., Inc.
Bituminous Emulsions — R. H. Cubberley, The Flintkote Co.
Traffic Paint — J. J. F. O'Neill, Goodyear Tire & Rubber Co.
Volatile Solvents for Organic Protective Coatings — M. B. Chittick, American Mineral Spirits Co.
Accelerated Tests for Protective Coatings — R. H. Sawyer, Devoe & Raynolds Co., Inc.
Methods of Chemical Analysis, Paint — C. Y. Hopkins, National Research Council of Canada.
Varnish — J. C. Weaver, The Sherwin-Williams Co.
Optical Properties — W. C. Granville, Container Corp. of America
Resins — R. W. Stafford, American Cyanamid Co., and C. F. Pickett, U.S. Dept. of the Army
Exterior Exposure Testing on Wood — W. G. Vannoy, E. I. du Pont de Nemours & Co. Inc.
Shellac — C. C. Hartman, National Bureau of Standards
Specifications for Pigments (Dry and in Oil) — C. L. Crockett, Norfolk & Western Railway Co.
Printing Inks — A. C. Zettlemoyer, National Printing Ink Research Institute
Flash Point — A. L. Brown, Associated Factory Mutual Fire Insurance Cos.
Physical Properties of Materials — M. R. Euverard, Interchemical Corp.
Cellulosic Coatings, Related Materials — F. H. Lang, The Sherwin-Williams Co.
Painting of Metals — A. J. Eickhoff, National Lead Co.

TECHNICAL Bulletins

HYDROCARBONS

Handbook of up-to-date information on hydrocarbons and petroleum fractions is found in "Data Book on Hydrocarbons" by J. B. Maxwell, chemical engineer, Standard Oil Development Co. It includes basic data on hydrocarbons and petroleum fractions; methods of applying these data to process engineering, including illustrative examples and some fundamental theory; and applications of certain of the unit operations of chemical engineering used in the petroleum industry. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. Price $7.00.

VALVES

Service bulletin describing types, sizes, operation and features of Rockwell-Built Nordstrom Corrosion Resistant Valves has been issued by Rockwell Manufacturing Company.

Special reference is also made to Nordstrom Multiport, steam jacketed and power operated valves and their varied applications in the chemical and process industries. The bulletin contains typical analyses of the following alloys: cast iron, steel, semi-steel, bronze, mercoloy, ni-resist, stainless steel, nickel, monel and hastelloy B. Tables are included listing approximately 175 different chemicals with their recommended alloy valves and lubricants.

Write for Bulletin V-217, Rockwell Manufacturing Company, 400 N. Lexington Avenue, Pittsburgh 8, Penna.

MOTORS AND CONTROLS

Brochure discusses the co-ordinated application of motors and controls in solving general application problems common to the chemical industry such as corrosion, hazardous locations, outdoor service, and minimum space and weight. Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

ALODIZING

Protection of aluminum with Brush Alodine is described in folder issued by American Chemical Paint Co., Ambler, Pa. The folder covers such important factors as comparative tests, chemicals and equipment required and advantages of brush Alodizing.

STORAGE RACKS

Bulletin 5221 presents Barrett steel storage racks for drums, barrels, crates, bins, skids and pallets. All these applications are illustrated with installation views.

The need in many establishments for more floor space clashes with the discouraging cost of new buildings. This bulletin demonstrates how storage rack systems solve this dilemma in an economical and satisfactory manner.

Storage Rack Bulletin 5221 will be mailed upon request by Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.

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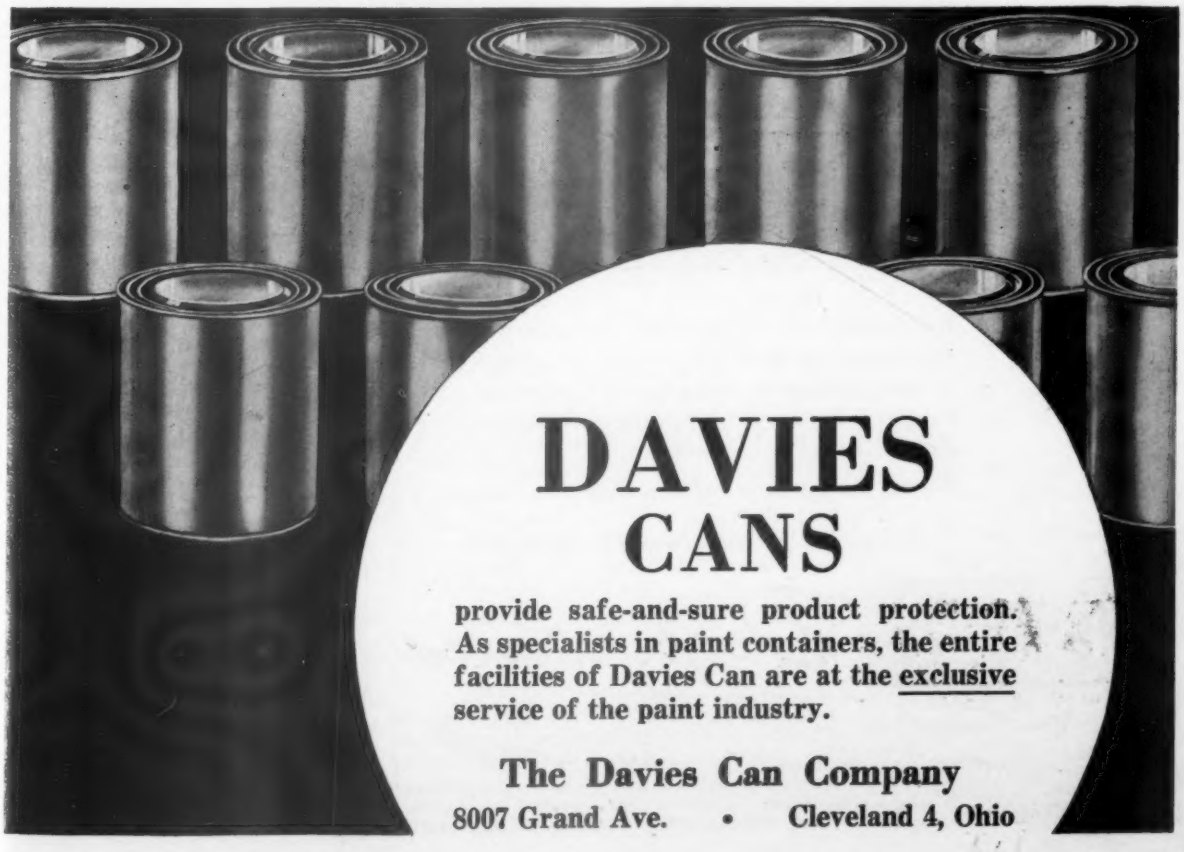

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SAFETY VALVE

Catalogue sheet has been prepared by the Central Safety Equipment Company on the Vent-A-Drum Safety Valve, the safety valve that eliminates fuel explosions in standard metal containers by controlling pressure changes.

Copies of this 2-color sheet may be had by writing to the Central Safety Equipment Company, 2200 E. Huntingdon Street, Philadelphia 25, Pa.

ESTERS

Booklet on "Esters" has been published by Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation. This booklet describes the more than 30 esters that are sold by the Company; their uses, physical properties, and shipping data.

The booklet describes the solubility of various resins in some of the esters as well as their performance in nitrocellulose lacquers. Also included is a bibliography that lists the important references to esters in chemical literature.

An important feature of this new booklet is a section covering the specifications of the esters as they are shipped. This section is complemented by a complete description of the control tests that are recommended by the Company for determining these specifications.

Copies of "Esters" (F-4766), are available from Carbide and Carbon Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

SHIPPING TECHNIQUE

A new eight-page booklet released by The Baker-Raulang Company, 1230 W. 80th St., Cleveland 2, Ohio, shows how manufacturers, whether they ship their products by company-owned fleets or common carriers, can use the unit load shipping technique to make the most of recent Interstate Commerce Commission decisions which lowered pallet-return rates in the Central States region.

These ICC rulings set a precedent for similar legislation all over the country, making the use of palletized loads more attractive than ever to shippers.

The booklet brings shippers up to date on unit load shipping, tells how unitized loads save money on the shipping dock by cutting manpower requirements and reducing pilferage and damage losses. Action photos illustrate the unit load system at work.

PAINT DEODORANTS

Deodorant compounds developed for use in the deodorization of latex emulsion paints is described by Sindar Corp., 330 W. 42nd St., New York, N. Y., in its recently issued technical bulletin P-1.

The bulletin contains complete information on these deodorants, called Paintodors, including prices, concentrations, method of application, and preliminary testing.

CASHEW RESINS

Cashew resins are the subject of a leaflet which gives an interesting story of a resin in a nutshell by the Irvington Varnish & Insulator Co., Irvington, N. J. Cashew resins manufactured by this firm are available in many forms for a wide range of applications.

FILLING MACHINES

Twelve page catalog discusses straightline, semi-automatic liquid filling equipment. Four basic types, operating on either vacuum or gravity principle are described. Packer Machinery Corp., 30 Irving Place, New York 13, N. Y.

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Four-page booklet discusses a new surface tension measuring device which can be used in the plant or laboratory for control purposes. Advantages of this instrument are covered together with its construction and method of making the test. Joseph B. Kushmer, Electroplating School, 115 Broad St., Stroudsburg, Pa.

HOT SPRAY DEVICE

Illustrated folder presents engineering data on "Thermo-O-Spray", an attachment used for hot spray painting. The hot spray process is discussed covering the advantages of this type of spraying. Special Equipment Corp., 225 Lafayette New York, N. Y.

CONVEYORS

28-page Book No. 2475 contains photographs of the Bulk-Flo in a wide variety of applications, together with typical layout drawings, engineering data, calculation tables, charts and formulas. Over 150 materials are analysed for average weight and such characteristics as size, flowability and abrasiveness. Link-Belt Co., 307N. Michigan Ave., Chicago 1, Ill.

ORGANIC CHLORINE COMPOUNDS

Booklet that covers the family of "Organic Chlorine Compounds," has been published by Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation. This "family booklet" describes the eleven organic chlorine compounds that are sold in commercial quantities by the Company; their uses, physical properties, specifications, and shipping data. Also included in the booklet is a bibliography that lists the important references in the chemical literature to the organic chlorine compounds discussed.

An important feature of this booklet is a section covering the specifications of the organic chlorine compounds as they are shipped.

Copies of "Organic Chlorine Compounds" (F-4769A) are available from Carbide and Carbon Chemicals Company, 30 East 42nd Street, New York 17, New York.

SPECIFICATION LACQUERS

Handy guide to specification lacquers for finishing military items is available from Hercules Powder Co., Wilmington, Del.

The first section of the leaflet enables suppliers of finishes to find out what kind of lacquer finishing material is being called for when all they have is a specification number.

In the second section of the leaflet, the permissible or appropriate specification numbers are grouped according to use. In this section specification numbers for finishing such items as vehicles, aircraft, ammunition and conponents, furniture, and containers are included.

CLASSIFIED ADVERTISEMENTS

Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

VARNISH PLANT — wanted small varnish plant with 3 or 4 fires in good condition with location in Jersey-Metropolitan area; willing to buy or lease. Box 141, Paint and Varnish Production.

ATLAS SORBITOL is particularly suited for the synthesis of alkyds notable for excellent drying, flexibility, gloss, and compatibility with other materials. Sorbitol-based alkyds assure superior stability in the finished product.

Sorbitol is the polyol of outstanding purity, color, and uniformity. On availability and price stability alone, sorbitol rates the "best buy" in polyols. Made from sugar, it is available in practically unlimited quantities; and, through the years, the price trend of sorbitol has been downward.

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Industrial Chemicals Department

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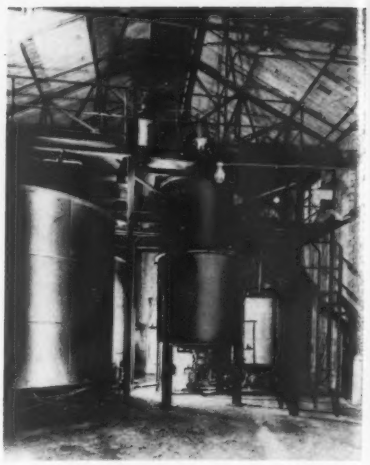
ATLAS POWDER COMPANY, CANADA, LTD., BRANTFORD, CANADA

Chemical Institute of Canada Conference Slated for June 2-4

Technical papers on 110 subjects, and the only exhibit of chemicals and chemical process equipment in Canada are among the attractions expected to bring more than 1,000 delegates to Montreal for June 2,3,4, to attend the 35th Annual Conference of The Chemical Institute of Canada. The sessions will be held in the Sheraton-Mount Royal Hotel.

The exhibits of chemicals and process equipment will be open for the three days of the Conference. The 34 exhibitors will have technical personnel on hand to answer questions and provide information about their products.

The second and third days will feature technical sessions at which topics to be covered are: analytical chemistry; biochemistry; chemical education; chemical engineering; high polymers; organic chemistry; physical chemistry; protective coatings; rubber chemistry and wood chemistry. Special symposia are being held on: Instrumentation; Industrial waste control; Wood chemistry covering the chemical structure of wood, and products from chemical processing of wood; Training of chemists in Canadian universities; and School science in Canadian schools.



Hydrogenation unit at Hardesty's Canada plant.

Hardesty Opens Fatty Acid Plant in Canada

The first plant in Canada for the production of hydrogenated fatty acids and glycerides in the inedible field has just been completed at New Toronto, Ont. — a $100,000 enterprise by W. C. Hardesty Co.

The new hydrogenation equipment includes all the latest improvements, developed through years of experience in operating similar units at W. C. Hardesty Co.'s Dover, Ohio, plant. It is designed to be operated completely by one man. The progress of the entire reaction is automatically recorded on a centrally located control panel from which all process variables may be controlled.

•

Melnick Named Tech. Director Of Industrial-Marine Products

S. J. Melnick has been appointed technical director and general superintendent of all plant and laboratory operations of The Industrial Marine Products, Inc., a division of Burry Corp. of New York City.

•

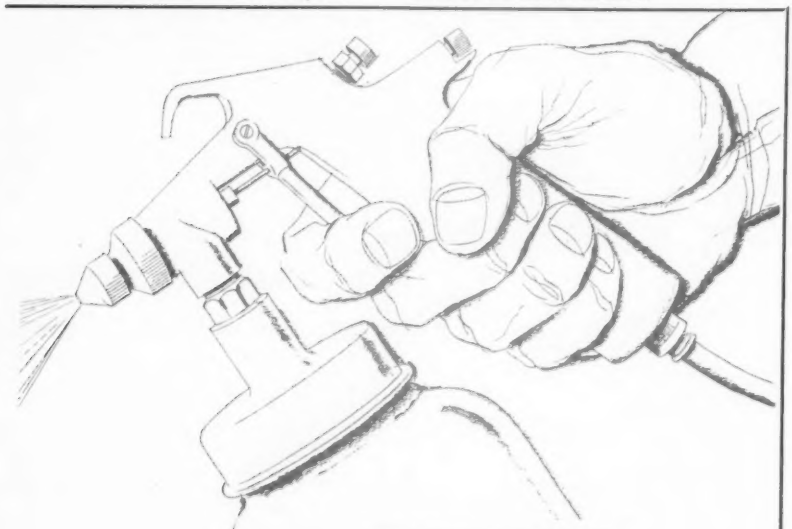
N. Y. Paint Travelers To Hold Outing, June 23

Annual outing of the New York Paint Travelers will be held on Monday, June 23rd at the Briar Hall Country Club, Briarcliff, Westchester, New York.

•

Protective Coating Fellowship

Professor L. L. Carrick of the University of Michigan is seeking four or five young men interested in obtaining a Masters Degree in the science of Protective Coatings. Those who qualify and are interested, contact Professor Carrick at the University of Michigan, Ann Arbor, Mich.



Solvents
acetone
ethyl acetate
isobutyl acetate
isobutyl alcohol
isopropyl acetate

Plasticizers
dibutyl phthalate
diethyl phthalate
di-(2-ethylhexyl) phthalate (DOP)
di-(methoxyethyl) phthalate
dimethyl phthalate
diethyl maleate

Anti-skinning Agents
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hydroquinone mono methyl ether
mono-tert-butyl hydroquinone
Tenamene 20®

Film Bases
cellulose acetate
cellulose acetate butyrate

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for the paint, varnish and lacquer industry

Stocks of most of these Eastman Industrial Chemicals are carried in the larger industrial centers of the United States. For further information, write or call our nearest representative.*

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TENNESSEE EASTMAN COMPANY, Division of Eastman Kodak Company, KINGSPORT, TENNESSEE

NEWS DIGEST

D. M. Pratt of Marbon Announces New Resins

D. M. Pratt

D. M. Pratt, sales manager of the Marbon Corp. of Gary, Indiana has announced the introduction of "9200" paints chips and "9200" paint resin to the paint industry.

The paint chips are especially suited for the small manufacturer for formulating a wide variety of finishes. The paint resin has been designed for the large manufacturer since it has good compatibility with other types of resins, plasticizers and extenders.

•

American Cyanamid to Produce Chemicals from Natural Gas

American Cyanamid Company will build a plant near New Orleans, Louisiana for the production of chemicals from natural gas, it was announced today by K. C. Towe, the Company's President. This will place Cyanamid in the vast field of basic production from hydrocarbons, a development which is expected to add a substantial number of new items to the list of more than 5,000 products already manufactured by the Company, Mr. Towe said.

The new plant for which a Certificate of Necessity was recently issued by the Government, will represent an investment of about 50 million dollars and will be located on a 600 acre site in Jefferson Parish, Louisiana, about 10 miles above New Orleans on the West bank of the Mississippi River.

As initially projected, the plant will produce ammonia, acetylene, hydrocyanic acid and derivatives of these products, among them acrylonitrile and ammonium sulfate. These basic materials provide a foundation for the eventual production of a wide range of both hydrocarbon and nitrogen chemicals for industrial use and for agricultural purposes.

•

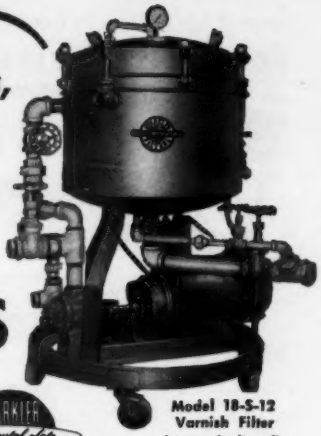
Correction

The news item regarding Ken Swarthout's appointment as technical director of McCloskey Varnish Co., which appeared on page 41 of the May issue is incorrect.

Mr. Swarthout has been named technical representative and Mr. J. O. Olson is vice-president and technical director.

Remove "Fish Eyes", Skins, Incidental Solids and Semi-Solids from Varnish and Lacquer with . . . .

SPARKLER FILTERS

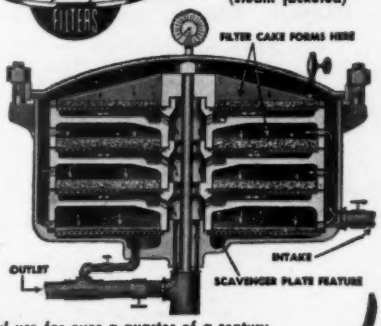


Model 18-S-12 Varnish Filter (steam jacketed)

Many varnish makers now use Sparkler Filters to clarify varnish, lacquers, and other clear liquids. The brilliance and polish obtained by filtering with Sparkler Filters is far superior to results obtained with other methods of clarifying paint products.

Our engineers are ready to give personal attention to your problems.

Write Mr. W. J. Kracklauer.

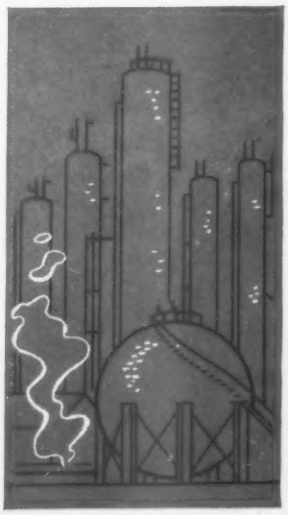


SPARKLER

MANUFACTURING COMPANY

MUNDELEIN, ILL.

Makers of fine filtration installations for industrial use for over a quarter of a century



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FOR FASTER, FINER GRINDS

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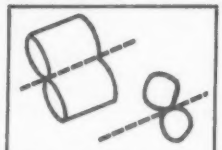
Yes!! BURUNDUM gives you faster, finer grinds than conventional media, and here's why —

REASON ONE

BURUNDUM's unique, tubular shape.



Burundum's tubular shape means greater grinding contact area. No matter how the media falls contact area is greater than the pin-point contact characteristic of spherical media.

REASON TWO

BURUNDUM's high specific gravity — 3.65. This high unit weight permits higher mill speeds—more contacts per minute—higher grinding consistencies.

REASON THREE

BURUNDUM's extreme hardness—9.0 on the Moh's Scale. This high hardness assures positive attrition and minimum wear of the medium.

TO GET MORE OUT OF YOUR MILLS, PUT BURUNDUM IN!

397-C

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For reliable gloss measurements according to ASTM D523-49T on paints, varnishes, and lacquers.

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DEVELOPMENT, RESEARCH

(*From page 25*)

do not exist there.

4. Having your attention directed to the phases which are shown to be out of control, you subject each part of your thus accentuated phase to individual attention until you can precisely point to the factor causing your uncontrolled variance.

The design of significant control technic becomes of prime significance in relation to cost of finished product when you have to use alternate materials in an existing process because of unavailability of the regular materials. If you have a record of control established with your customary raw material, when you substitute another material you get a prompt evaluation with a speed and precision and reliability otherwise unobtainable.

Why Vertical Integration?

PRODUCTION and Management Men are making decisions on still another group of fundamental questions related to Vehicle and Alkyd Manufacture. They ask:

Shall we design our plants for either (1) the most efficient way of putting together purchased raw materials or (2) the manufacture of both components and finished products, and save the majority of overhead costs as applied to the components?

The answer to this question again requires research background. Today many companies consider it most advantageous to be vertically integrated where—

(1) Raw material cost is high in relation to the final selling price of the product.
(2) The volume handled is large and in large units.
(3) Where a few components constitute a large percentage of the ingredients of the finished product.

This describes a portion of the Varnish and Vehicle field. However vertical integration appears to be a disadvantage where—

(1) Volume is high but in a variety of items moving in small units.
(2) Where many components make up the finished products.
(3) Where sales are varying within a wide range of diversified products.

This situation also describes a portion of the Varnish and Vehicle field.

The individual situation governs the decision. The production Research and Development gives you the facts.

The Research and Development Team do not attempt to handle the various complex and perplexing problems connected with production in microscopic detail nor to present a panoramic telescoped view of industry as a whole.

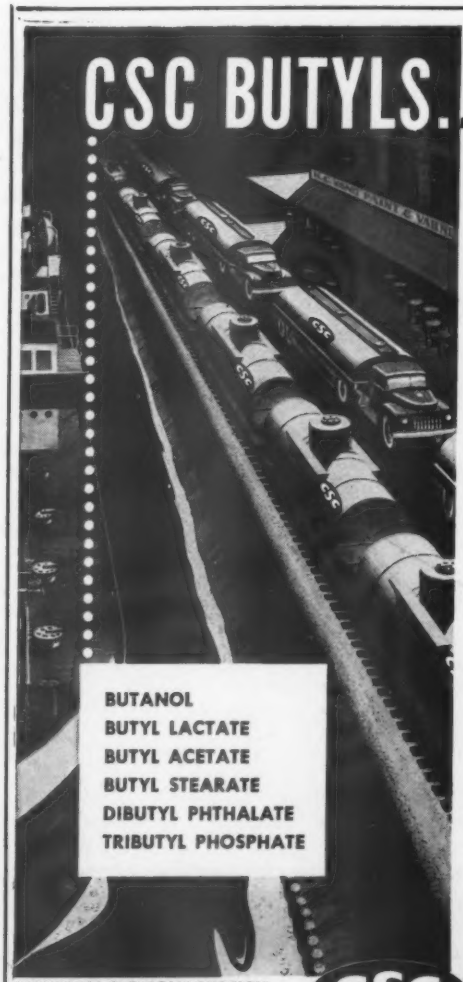
No matter how varigated it may be, they reduce their material to an oriented structure map, adequately and specifically detailed to the consideration at hand. Their data becomes an "ordinance" map of objectives pointing out where "adjustment" of a real structure is necessary, how this can be done, what the structure will be like when the adjustment is made.

•

A-M Appoints L. K. Buell Chief Chemist of Research

L. K. Buell has recently rejoined American-Marietta as chief chemist in charge of development in the newly-created Coating division.

Mr. Buell will concentrate principally on roll coat finishes.


CSC BUTYLS...in America's production picture
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Take a good look at the butyls picture at CSC. Commercial Solvents Corporation was the first producer of Butanol by an exclusive fermentation process in 1920. Today, with greatly expanded production facilities, backed by a quarter century of know-how, CSC is still a leader in the butyls field.
Plants, warehouses and sales offices coast to coast bring CSC's butyls and butyl derivatives to industry's door. No matter what your need . . . from a drum to a tanker . . . CSC is ready to serve you promptly, efficiently.
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AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: HOW TO MAKE PAINT STICK TO GALVANIZED IRON WITH LITHOFORM®

INTRODUCTION

"Lithoform" forms a dense, zinc phosphate coating on zinc, cadmium, and galvanized surfaces—including Galvanneal, cadmium plated steel, zinc plated steel, zinc base alloys, and zinc base die castings. The "Lithoform" coating, which is non-metallic and inactive, retards reaction between alkaline metal oxide and the paint film. Peeling and loss of adhesion are thus greatly retarded on painted Lithorized zinc and cadmium.

ADVANTAGES OF "LITHOFORM"

"Lithoform" forms a durable bond for paint. It is economical. It eliminates frequent repainting. It protects both the paint finish and the metal underneath. "Lithoform" meets these Government Finish Specifications:

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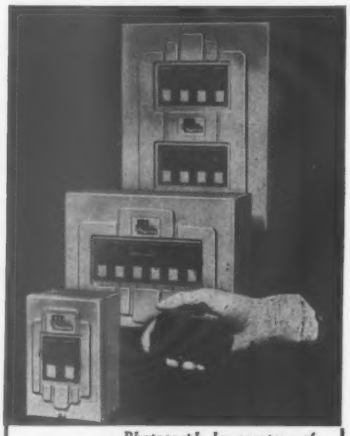
RR-C-82
MIL-E-917A (Ships)
JAN-F-495
AN-F-20
U.S.N. Appendix 6



Photograph by courtesy of Murray Manufacturing Corp.

Murray Circuit Protectors are fully magnetic and provide maximum protection for both domestic and industrial wiring. Housings are of galvanized iron which is Spray Lithorized for long paint life.

THE LITHORIZING PROCESS

"Lithoform" can be applied by brushing or spraying the work with simple hand equipment, by dipping it in tanks, or by spraying it in industrial power washers.

Brush. Galvanized bay windows, cornices, rain gutters, hardware, building siding, truck panels, and farm equipment are typical of the many surfaces that are treated effectively with Brush "Lithoform".

Dip. This grade is used for coating cleaned surfaces of such typical products as cabinets, refrigeration condensers, etc., immersed in heated solutions in tanks.

Spray. The spray process is the most logical one with which to coat sheets, coiled strip or duplicate products best processed on a conveyor.

CHEMICALS ACP PROCESSES **WRITE FOR FURTHER INFORMATION ON "LITHOFORM" AND ON YOUR OWN METAL PROTECTION PROBLEMS.** CHEMICALS ACP PROCESSES

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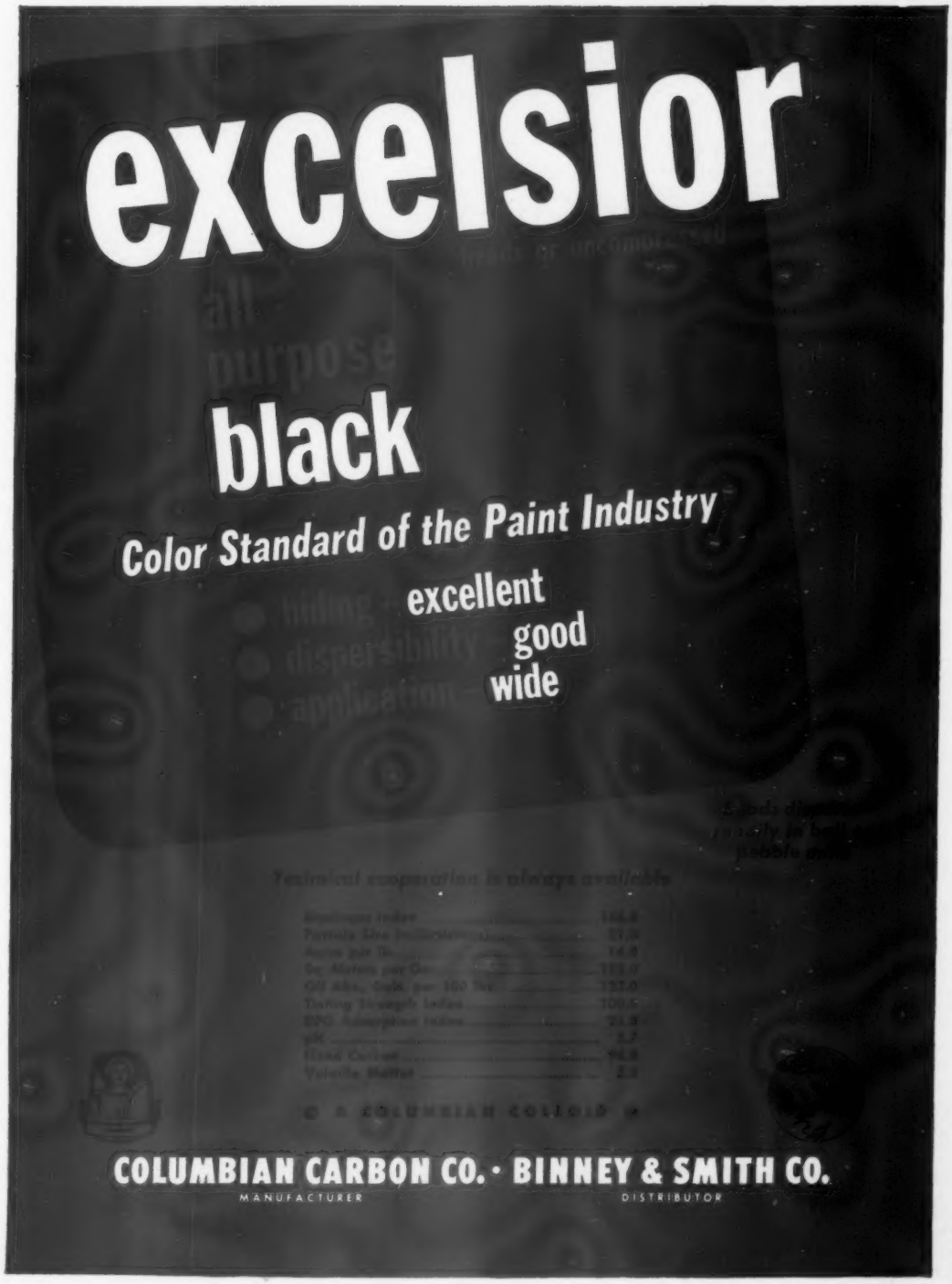

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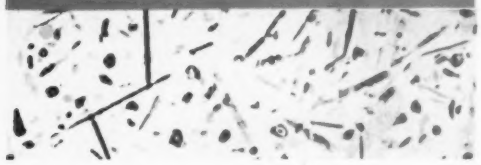
high

AZO ZZZ-22

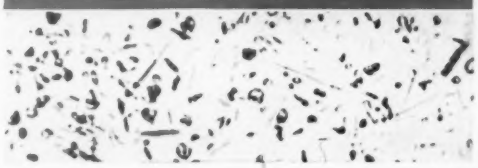
A high oil absorption Zinc Oxide having large Acicular Particles which gives heavy body



medium

AZO ZZZ-11

A medium oil absorption Acicular Zinc Oxide imparting exceptional weathering qualities to exterior paints

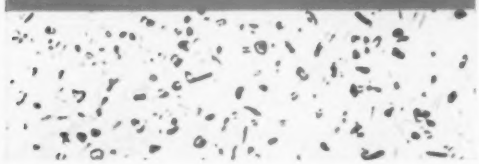


AZO acicular lead-free zinc oxide is a superior pigment available in a wide range of oil absorptions

low

AZO ZZZ-33

A definitely Acicular type with a lower oil absorption, but chemically identical with AZO ZZZ-11 and AZO ZZZ-22



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